THE MADRAS

MONTHLY JOURNAL

OF

MEDICAL SCIENCE.

VOLUME SIXTH.

JULY—DECEMBER 1872.

MADRAS:
Published and Sold
BY CALEB FOSTER,
FOSTER PRESS, 23, RUNDALL'S ROAD, VEPERY.

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No. XXXI.—JULY, 1872.

ORIGINAL ESSAYS.

ART. I.—*The Earth-salts of Bellary.* By EDWARD NICHOLSON, F. C. S., Assistant Surgeon, Analyst of Water, Mysore, Northern and Ceded Districts.

THE soil of the Ceded Districts yields three saline products—salt, nitre and soda. I have lately examined the first two of these in the course of my investigations on the peculiar salinity of wells sunk in black cotton soil.

SALT.

Any person who has been in Bellary must have remarked mounds of black cotton soil here and there about the outskirts of the cantonment. These mounds are raised for the purpose of being worked for earth-salt; when exhausted they are abandoned and become gradually levelled by the scanty rain of years. They are generally situated not far from the lines of drainage of the country at any convenient spot where the soil is saline and water can be easily obtained. Patches of the most saline earth, tested in a simple manner by application to the tongue, are dug up and heaped in a mound ten or twelve feet high; at different levels of the mound funnels are excavated and lined with beaten earth; and the loose earth being placed in these is gradually exhausted by repeated washings. The water having been sufficiently

charged with salts in its passage through the different funnels is run on to a level floor of rammed earth surrounded by a low rim. Under the influence of Bellary sun, evaporation is effected in a few days and a residue of salt is left. This is piled in heaps for any moisture (bittern) to drain off, and when dry, it is sold to the villagers for domestic consumption. The wholesale price is about 30 seers (measures) for a rupee; it is retailed at about eight cash per seer, which is half the price of sea-salt. It is not usually sold in cantonment, as it is never used by the population of sepoys, camp followers and other people not belonging to this part of the country; its use seems to be entirely confined to the villagers.

Bitter flavour is sometimes alleged by the camp population as the reason why this salt is not used, but I am inclined to think that the dislike is more caused by prejudice against the source of the salt.

I have examined several specimens of earth-salt and found them to differ very widely in composition, some being of considerable purity whilst others contained as little as 44 per cent. of sodium chloride. In some cases I found that the fresh salt consisted of perfectly pure and white crystals of sodium chloride bathed in a mother-liquor of deliquescent calcium and magnesium salts, principally nitrates with some chlorides and sulphates. Either washed with cold water and then dried, or pressed between folds of blotting paper, the crystals were much purer and whiter than any sea-salt; but before this cleansing, a distinctly bitter flavour was imparted by the mother-liquor.

One specimen was brought to me by a man who engaged largely in the manufacture, as a fair specimen of the salt produced in his district. This I subjected to complete analysis. When air-dried it still contained 3 per cent of moisture; it was of slight alkaline reaction, clean, but of white effloresced appearance without any regular crystals. Exsiccated, it had the following composition per cent:—

Sodium chloride	44.50
Sodium sulphate	49.30
Magnesium sulphate	4·93
Magnesium nitrate	0·24
Magnesium carbonate	0·35
Calcium carbonate	0·70
Insoluble (sand, clay &c.,)	0·45
	100·47

A person consuming daily the moderate amount of a quarter of an ounce of this salt would take along with the real salt a quantity of sodium and magnesium sulphates (anhydrous) equal to 121 grains of Glauber's salt and 12 grains of Epsom salt. I do not think that difference of taste would warn people against this. Magnesium chloride, nitrate and sulphate are very bitter, so also are calcium chloride and nitrate, and the presence of these in the mother-liquor adherent to crystals of salt would give a decided unpleasant flavour. This is not, however, the case with sodium sulphate; its taste is not very disagreeable, and in, this sample it seemed to be entirely concealed by that of the chloride; a slightly bitter after-taste arose from the magnesium salts present.

The purification of the different samples of earth-salt would have to be done in various ways differing according to their respective composition. Those which consisted of pure salt coated with the deliquescent earthy nitrates and chlorides could easily be purified by simple washing with a little cold water; but this would not do in the case of the sample containing a large quantity of sodium sulphate. If the quantity of sodium sulphate and other foreign salts did not exceed one quarter, the best plan would be to lixiviate the salt gradually with an equal quantity of hot water. But when, as in the case of the above sample, the quantity of sodium sulphate amounts to fully one half, the purification would be best done in the following manner. Wash the salt with a very small quantity of hot water to remove magnesian and other deliquescent salts; then, the salt having cooled, add to it an equal quantity of the coldest water; the sodium chloride will dissolve to the extent of 40 parts in 100 of water, whilst the sodium sulphate will dissolve much more slowly and in a quantity inversely proportionate to the coldness of the water. A hundred parts of water take up 10 parts at 60° F., 15 parts at 68°, and 20 parts at 77°. The colder the water, the less sodium sulphate will be taken up; the residue will consist entirely of this salt, whilst the chloride can be recovered, by boiling, in a much purer condition. The residue might possibly be utilized for the manufacture of carbonate of soda by calcination with kunkur and charcoal.*

* One cannot however but be astonished that the manufacture of this culinary salt should be continued, in spite of its impurity and the small

The brackishness imparted by this salt to many of the wells sunk in the black cotton soil is different in character from that arising in consequence of 'previous sewage contamination.' In Bangalore where, owing to the porousness of the soil, whole districts of the station are saturated with the mineral products of excrementitious infiltration, the salts found are quite distinct; sodium chloride, earthy (calcium and magnesium) chlorides and nitrates appeared in quantities varying from 50 to 300 centigrammes per litre, but I never found the slightest increase in the small amount of sulphates normal in the Bangalore subsoil water. Whatever the character of the water they always remained low—about ·4 to ·6 centigramme per litre. In Bellary, out of the influence of the black cotton soil, the subsoil water does not differ materially from that of Bangalore; and like it contains a very small proportion of sulphuric acid; but the quantity of this constituent increases rapidly as the wells approach the black cotton soil—10 to 30 centigr. are not uncommon and one well yielded as much as 153 centigr. (equal to 227 centigr. per litre, or 159 grs. per gallon of sodium sulphate).

The sulphates are accompanied by a proportionate quantity of chlorides and invariably by some nitrates. The latter are in lesser proportion, as it is not usual in the water of uncontaminated soils for the amount to exceed 2 centigr. per litre. These saline waters are not very hard, the greater part of the salts being alkaline (sodic) rather than earthy; sodium chloride and sulphate are the principal salts present, earthy chlorides, sulphates and nitrates being in considerably smaller proportion. The distinguishing characters between these saline waters and waters charged with the mineral traces of sewage may be thus tabulated:—

Saline water from black cotton soil.	*Saline water from polluted soil.*
Much chlorine 40-100 cgr. per litre.	Much chlorine 20-120 cgr. per litre.
Much sulphuric acid 10-150 cgr. per litre.	Little sulphuric acid under 1 cgr. per litre.
Nitric acid variable 1-5 cgr. per litre. (rarely more)	Nitric acid large if not exposed to air and vegetation 10-30 cgr. per litre.

pecuniary advantage in its use, now that the railway passes through the Ceded Districts. I believe that Government loses a large amount of revenue owing to the substitution of this earth-salt for sea-salt.

'Permanent' earthy salts present; never greater than 'removable' earthy salts. *	Very much permanent earthy salts; generally largely in excess of removable earthy salts.

In many cases the liquor extracted by the salt-makers from the black cotton soil approaches very closely to sea-water in its composition, only differing materially by the presence of nitrates; the product of evaporation is hardly distinguishable from bay salt. The occurrence of sodium sulphate would seem to distinguish the mixture of salts from that found in sea-water, as that substance does not exist in sea-water; but its presence in earth-washings is readily explained when we remember that any sodium silicate or carbonate existing in the soil would decompose the earthy sulphates of marine origin; insoluble earthy silicates or carbonates, and soluble sodium sulphate being the result. And it is to be remarked that the soils which produce salt do not produce soda, the presence of the earthy sulphates that accompany the salt preventing apparently the soda being produced as it otherwise would be.

A peculiarity of the marine deposits (as I believe they are) diffused through the black cotton soil country is their tendency to accumulate in the lines of drainage; not only about dry water-courses at the low level of valleys but also near to the larger drainage system of the country. I am informed that, in some parts of the Ceded Districts, wells near to rivers give as a rule brackish water, quite contrarily to what one would expect. The reason of this is probably to be found in the very partial washing which the soil undergoes from the scanty rainfall. The salts are washed from the soil of the higher tracts of country, but, by the time the subsoil drainage water has percolated to the lower parts of the valleys, it is much nearer to the surface and the cessation of rain with the force of evaporation causes the salts to stop on their journey towards the sea.

In connection with this subject two points may be noted:—

1*st*.—These sulphated waters readily evolve sulphuretted

* I use these terms derived from the old soap-test purely for convenience, meaning by 'removable' earthy salts the carbonates and silicates of calcium and magnesium correctly ascertained. Boiling does not remove them however; a water may be entirely free from 'permanent' earthy salts (chlorides, sulphates, nitrates) yet show after boiling considerable permanent hardness. Evaporation to dryness and re-solution give far more correct results.

hydrogen when in contact with wood. Sojourn in a tub for one night causes most Bellary water to smell offensively by the next morning. This should not be confounded with 'putridity' as it too often is in sanitary documents.

2*nd.*—The sulphates and chlorides appear to be inimical to vegetable life when repeated irrigation has caused garden soil to become charged with these salts—but in more moderate quantity the sulphates have a beneficial effect on plants requiring much sulphur, leguminous and cruciferous plants for instance. Bellary onions are well known for their excellence and abundance, it is possible that they flourish in consequence of being so freely supplied with the sulphur necessary for the formation of their essential oil.

NITRE.

Nitrates are invariably found in well-waters derived from subsoils of decomposed felspar or of clay. Ammonia, whether that normally found in the atmosphere or that produced by organic decay, becomes oxidized when in contact with porous soil and, in presence of bases with weak acids—such as silicates and carbonates—it changes into nitric acid and expels the weaker acid. As there are few soils that do not contain silicates and carbonates of either potassium, sodium, magnesium or calcium, the presence of nitrates is nearly universal, and we would naturally expect to find them in the washings of the salt-mounds. The filtration of water through soil containing silicates or carbonates would generate nitrates even if none were present originally. I found as much as 1·5 per cent of nitric acid in the solid residue of a sample of earth-washings, a quantity equal to 176 centigrammes per litre of the fluid; and the moisture adhering to the crystals of salt subsequently obtained was highly nitrous. The nitrates present in the earth-washings are always the deliquescent nitrates of calcium and magnesium; the sodium salt being excluded in consequence of earthy sulphates and chlorides having already decomposed any sodium silicate or carbonate that would otherwise have been available for the saturation of nitric acid as it is formed. Potassium being comparatively of rare occurrence in these soils is excluded also from combination as nitrate. The nitrates existing in every sample of earth-washings that I have examined are consequently wasted; while if the mother-liquor of the salt crystals were treated with wood

ashes or other convenient source of potash, the earthy metals would be replaced by potassium, and nitre would be obtained. The quantity would, it is true, be not more than 2 or 3 per cent of the common salt obtained.

The nearest place where I could find nitre to be regularly made was at Sirragirri, about 20 miles north of Bellary. From the account given me of the process by the nitre-maker of Sirragirri it would appear that earthy nitrates are never utilized and that soil containing potassium nitrate already formed is the only kind worked. To obtain nitre at once in this condition in a country where potassium salts are rare in the soil, the nitre-maker must confine his operations to soils in the neighbourhood of villages, selecting those spots where from infiltration of urine, from the drainage of cattle sheds or from the vicinity of ash heaps, the earth has become artificially supplied with potash. Considering that Indians generally use the manufacturing processes which are best adapted to circumstances, and which though rude are quite as profitable to them as the more ingenious but more expensive processes of European industry, I am rather surprised that the addition of potash to earth-washings containing earthy nitrates is not practised in India as it is in Europe. The earth-washings are allowed to evaporate as in the manufacture of salt, and any earthy nitrates are lost in the mother-liquor. The nitre is obtained tolerably clean, in small prismatic crystals mixed with the cubic crystals of common salt; this impurity varies from 6 to 20 per cent or more. If required refined, it is purified by solution and recrystallization, a most wasteful process under the circumstances, as about 30 per cent of the nitre is lost.

The impure nitre is sold at one rupee per maund of 24 lbs.; when purified, the same quantity costs one rupee twelve annas. This very low price is, I think, occasioned by the nitre being too impure for shipment, and the manufacturers are not acquainted with the processes of refining economically. The nitre might be bought and refined at a total cost of not more than 12 shillings per cwt., it being worth 28 to 30 shillings at home. Ignorance of economical refining processes affords the only explanation of the low prices obtained for an article of such value. To refine it economically it would be necessary to accumulate a large quantity, mix it well, and determine from an analysis of a sample the process to be adopted for its purification. The process

applicable to a nitre containing only 5 per cent of impurity would be quite inapplicable to another sample containing 40 per cent of impurity.

SODA.

I have not been able to meet with any instance of this salt being produced near Bellary; that sold in the Ceded Districts is made, I believe, near Cuddapah. The sodium carbonate of which the impure soda principally consists is the result of the decomposition of sodium silicate by atmospheric carbonic acid. Silicic and carbonic acids are about of equal strength and it entirely depends on circumstances which acid can expel the other from its combinations. Silicic acid expels carbonic acid from solutions whilst carbonic acid acting in excess and for long periods of time expels silicic acid from solid silicates. In parts where the soda is produced it is found principally as an efflorescence on the surface, the sodium silicate of the soil having evidently been decomposed by atmospheric carbonic acid. Its presence is incompatible with that of earthy chlorides, sulphates and nitrates; and as these are constantly found accompanying the salt and nitre yielded by black cotton soil, it is evident that the production of salt or nitre excludes that of soda.

Natural sodium carbonate does not appear to be produced in India to any considerable extent, perhaps little in excess of the limited requirements of washermen.*

The main features of the production of these earth-salts may be thus summarized—

Salt is derived from marine deposits in the black cotton soil. It may be mixed with the following impurities:—

1*st.*—Marine earthy salts, principally magnesium chloride and sulphate.

2*nd.*—Sodium sulphate, produced by the decomposition of marine sulphates by sodium silicate.

3*rd.*—Nitrates, principally of magnesium and calcium.

Nitre does not accompany salt as such (as potash nitre),

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* For many years there has been advertized a machine warranted to produce ice by the aid of two salts indigenous to India and procurable everywhere at a cheap rate. The two salts are sal-ammoniac and carbonate of soda; most possessors of these frigefactive engines can give doleful accounts of their searches in the bazar after the last-named salt.

but indirectly as earthy nitrates. Potash nitre can only be obtained from soils to which potassium salts have been added accidentally or purposely. Soils containing the nitrified products of decayed animal matters are alone profitable to work; even in these there is great loss unless potassium salts be added.

Soda is produced in soils by the action of carbonic acid on the sodium silicate of decomposed felspar rocks. Both the carbonate and the silicate of sodium being decomposed by the soluble earthy salts which invariably accompany salt and nitre, soils yielding the latter salts cannot yield soda

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ART. II.—*Report of the Medical Committee appointed to investigate the causes of the Epidemic Fever, which has prevailed in the Provinces of Coimbatore, Dindigul, Madura and Tinnevelly, during the years* 1809, 1810 *and* 1811.

(Communicated by the Inspector General, I. M. D.)

SECTION FIRST.

A geographical description of the Provinces in which the Epidemic Fever has prevailed, with some account of climate in healthy seasons, of their agricultural products, and of the relative condition of their native inhabitants.

The Districts to which the attention of the Medical Committee has been particularly called, as those that have suffered most from the ravages of fever are Coimbatore, Dindigul, Madura and Tinnevelly; comprehending an extent of country in latitude about 3°30′ and in longitude, at some parts nearly 1°35′; a tract of territory, stretching in length from North to South, from the base of the great southern Ghauts of the Mysore country to the farthest extremity of the Peninsula; and in its greatest width from the vast mass of mountains which divide the two Coasts, to Tondy, on the Coromandel shore.

The Coimbatore Province under which are now included in one Collectorate, the Divisions of Caroor, Sattimungalum and Darampooram, may with safety be called an open

country when compared with many of those of our lower Indian Dominions although it is not without its woods* and partial wastes. It is bounded on the north and west by immense mountains, on the East by the countries of Salem and Trichinopoly and on the south by the district of Dindigul. In extent it may be reckoned from North to South about 50 miles: from East to West nearly 45. Contiguous to the southern extremity of Mysore, it in some degree partakes of its altitude, over all those lands which lie to the eastward and southward of it, in the Peninsula; the average plain being about 900 feet above the level of the sea, according to Major Lambton's measurement.

Coimbatore is watered by several rivers, the most considerable are the Cavery and Bhavanie. The first of these, has its source amongst the Coorgh mountains, which form a part of the western barrier of Mysore; and it joins the second at Bhavanie. The Noel and Amberabady with many rivulets are also tributary streams to the Cavery, so that by the time the great conflux of water reaches near to Trichinopoly this river has become one of the finest in India; and as far as regards the purposes of cultivation it has this advantage, that it is filled by both monsoons: by the Southwest in the months of June, July and August; and by the North-east in October, November and December.

From its elevation, it may naturally be supposed that the soil of Coimbatore is in general dry; it is on this account peculiarly well suited for pasture land, and the rearing of different dry grains; though there is at the same time no want of extensive tanks. In the vicinity of the *hills*† and in other estates lying near to the Dindigul Province there is much low marshy ground.

About 40 miles due west from Darampooram there is an opening in the great mountains which run south; it is well known by the name of the Paulcaudcherry pass, and is in width at its Eastern extremity about 7 miles, and in length at least 31. This pass is shaped like a funnel, being more than double the width at the end which opens towards the

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* The Annamaly woods celebrated as being the haunts of wild Elephants, lie towards the most southern and western parts of the Coimbatore country.

† Many of the villages of the Chuckragherry talook lie close to the Hills, in the neighbourhood of extensive marshes, and are proverbially unhealthy.

Malabar Coast, than it is at that by which it communicates with the District of Coimbatore. It is nearly on a level with the lands on either side of the Ghauts so that there is a free passage left for whatever winds may blow from Malabar in a direction from N. W. to S. E. and the distance from the Eastern opening of this pass to the sea at the nearest point, is above 70 miles.

The towns are in general well built and some of them are very large and populous; four of the most noted are Darampooram, Coimbatore, Bhavanie and Caroor.

Darampooram stands in a fine high open country; its houses are for the most part well constructed and it has the river Amberabady within about half a mile of it. It is nearly 40 miles distant from the great mountains which run south, but is not more than 15 from the Verapachy or Pulney Hills, in the Dindigul Province.

Coimbatore also stands high* and dry; but is much nearer than Darampooram to the mountains which divide the Peninsula; it is however situated so far north as to be clear of the Paulcaudcherry opening, which gives it a great advantage with regard to climate and comfort over the last mentioned town, as we shall particularly notice at a future period; it is tolerably well built, but its well-water is considered as brackish; and is supposed on that account, to be the frequent cause of cutaneous affections which are common amongst the poorer inhabitants, who cannot afford to get supplied from the Noel, distant about one mile.

Bhavanie stands at the conflux of the Cavery and Bhavanie, and is from this peculiarity of situation much resorted to by the Hindoos, who consider it as a place of more than common sanctity: to the south-east towards Sankerydroog, there is a good deal of jungle and rocky ground: to the southward along the banks of the Cavery lies a fine extensive flat country; and to the north-west, are the rich and picturesque banks of the Bhavanie; the town is not so large as Coimbatore but is well built, and notwithstanding its peninsular situation, dry and comfortable.

Caroor is a large handsome town with wide regular streets, it is situated upon a gentle rising ground, in a fine open dry country and not far from the banks of the Cavery; it is very populous, its Latitude is 10.° 54′. north,

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* Coimbatore is in Latitude 11° 3,′ Longitude 77° 6.′

and it is at the great distance of 74 miles from the Western Ghauts, and 30 from the Pulney mountains.

The Dindigul and Madura Districts, together with Zemindaries of Shevagunga and Ramnad being now comprehended in one Collectorate, we shall speak of them, with respect to certain particulars, conjointly. They occupy a space of territory of nearly one degree in latitude, and in longitude about one and three quarters; that is to say from the northern base of the Pulney mountains to Verdapetty in a southerly direction; and from the great Ghauts to Tondy (in the Ramnad Division) from west to east. Their most western tract is the Dindigul valley which extends from Dindigul in latitude 10° 12′ to Goodalore in latitude 9° 35′.

This valley is formed by the great mass of Pulney mountains towards the north, by those which make the boundary of Travancore towards the west; and on the east by a lower range of hills, which extend from Dindigul south to the bottom of the valley* near Shevagherry, where they unite with the great Western Ghauts. A projection from this range, commonly known by the name of the Aligherry Hills stretches eastward within about 14 miles of the garrison of Madura. These are the nearest high lands to that fortress, and are washed along their northern base by the Vyāar river which is formed by several streams that have their sources in those Hills, bounding the Dindigul valley, and which unite at Goolapooram towards the mouth of the valley. The Vyāar † then taking a south-east direction passes close to Madura, and after traversing the Shevagunga and Ramanad Zemindaries, loses itself in a large tank near Athanghurry, 20 miles south of Tondy; there are other streams which run across the Madura District and flow into the ocean betwixt Valiacondum and Vembar in the Gulf of Manaar.

Dindigul may justly be called a mountainous and woody country; encompassed as it nearly is by high lands, which are all more or less covered with jungle of a prodigious height and which extend all the way to the Western Ghauts.

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* The Dindigul Valley is in length about 75 miles, in breadth 20.

† An extraordinary circumstance regarding this river is, that although on passing Madura it is of considerable size, it is afterwards so completely diverted by artificial means, for the purposes of cultivation, that its bed at Ramanad is generally dry throughout the year and only contains water in unusual floods.

The villages of the Dindigul District, are in general not so well built as those of Coimbatore: the floors of the houses are not sufficiently raised above the level of the ground; and the houses themselves, especially those belonging to villages situated amongst the mountains, are often low, miserable and badly thatched.

The principal Towns of the Dindigul territory, are Dindigul, Vedasundoor,* Pylny Perriacottah† but it will be enough for our present purpose to mention that of Dindigul.

This is situated towards the western extremity of an extensive plain, which from east to west, is about 30 miles long; its greatest width from north to south 25; and it is almost entirely surrounded by very high mountains. The town itself lies extremely low, and stands within about 6 miles of hills, which are directly south from it; the Fort and fortified rock, are close to it towards the west, and the latter has at its base a large weedy tank.

Dindigul is by no means so well built as some of the towns we mentioned in Coimbatore. Before the fatal epidemic, it was computed to contain upwards of 7,000 inhabitants; but now we do not suppose that the population amounts to half that number.

These lands farthest from the Hills in this district are invariably higher and drier than others lying near their base; and many large, marshy and weedy tanks are to be found, particularly in the talook of Toddycomboo.

The general plain of the country is considerably lower than that of Coimbatore, though higher than those of Madura and Tinnevelly; and, adopting the theory that the elevation increases according to the distance from the sea, along the course of the rivers, we shall find, (the height of Coimbatore being already ascertained) that Dindigul is about 400 feet above the level of the ocean.

The Madura Province is more open than that which we have just noticed; as it lies in some measure between the high Dindigul mountains and the sea; and has, east of its meridian, only the insulated hills of Toverincourchie‡ and Cotampetty‡ which approach it within about 16 miles in a N. E. direction. We have observed, both in this District and that of Tinnevelly, that at the distance of 8, 10, or 14 miles

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* In the Toddycomboo talook.

† In the Iyempilly talook.

‡ These are commonly called the *Nuttum* hills.

from the mountains, the country is much higher and drier than it is farther west, where there are often to be met with marshy tracts lying within a short distance of the hills ; and rendering the villages in their neighbourhood extremely damp and unhealthy.* There is much jungle in some parts, particularly in those nearest to the boundaries of Tondiman's country, the high lands which surround the Towerinchouchie, and to a certain degree Cottampetty, are covered with thick woods and there is a great deal of low fenny ground between these two villages.

The general character of the Shevagunga Zemindary, is that of a dry country, having a light soil. It is much overrun with jungle; but though flat, there is no cotton ground in it; the paddy lands are confined to the left bank of the Vyāar which is finely cultivated; few tanks are to be met with, and scarcely any hills.

The Zemindary of Ramnad has not a hill in it; it is by no means so dry as the last mentioned and has of late years suffered much from the inundations of the Vyāar which are very unusual in common years. There are some tracts of cotton ground and in the vicinity of Kilcarry there are salt marshes which communicate with the sea.

The towns and villages of the Madura District, though perhaps upon the whole better built than those of Dindigul, are many of them particularly in remote situations near the mountains, miserably constructed and badly thatched.

The four largest towns are Madura, Tirummungalum, Cholavandum and Nuttum.

The following description of Madura is taken from a paper of the 3rd Member of this Committee, which has been laid before Government by the Medical Board :—

" Its site is low, compared with the country adjoining.
" It is surrounded with a wet ditch, which with several
" tanks within the Fort is filled from the river : in the
" immediate vicinity there are many tanks and rice grounds
" also supplied with water from the river. The Fort is
" 3¾ English miles in circumference. It was some
" years ago supposed to have contained 40,000 inhabitants
" although now from various causes I imagine 20,000 to be
" the utmost number of its population. The inhabitants are

* This particularly applies to such situations as lie near the base of that projection of lower hills (before noticed) which advance from the Dindigul mass till within 14 miles of Madura, for instance the Divisions of Madacolum and Aunyoor.

" with a few exceptions extremely poor and their houses the " most low and mean description of huts. The streets are " narrow, filled with dirt and rubbish, and the old drains " having been long since choked up the rain water stands " everywhere in stagnating pools. Thousands of cattle are " kept within the walls; nor is there any regard paid to " cleaning out the various descriptions of filth which is allow- " ed to accumulate."

" The Fort is also much crowded with trees which, besides " the bad effects resulting from their decayed leaves, greatly " retard evaporation, and the water in the tanks within the " Fort being seldom removed is generally putrid and ex- " haling fetid vapours."

The Tinnevelly Province is considerably lower than any of the others in which the epidemic has prevailed. It extends in latitude from Verdapetty in 9° 41′ to Cookapootie near the southern extremity of the peninsula in 8° 7′ and in longitude, at its greatest width from Collatore on the east coast to Pooliery at the opening of the Ariaregowel pass, about 1° 15.′ Its western barrier is the great range of Travancore mountains.* To the east and south it is bounded by the Ocean, and to the north, by the District of Madura. With regard to its elevation, it possesses the same variation as is found to be general throughout the lower districts of India, increasing with the distance from the sea. Palamcottah is ascertained to be about 200 feet above the level of the main.

Tinnevelly may in the strictest sense be called an open country, as few hills are to be found in it and those are insulated or detached. It however contains several waste and jungle tracts, especially towards the east in the neighbourhood of Tuticorine : and in the Calcaud and Punjmahal divisions there are numerous palmyra trees, growing in a sandy soil and interspersed with dry grain cultivation. There are also here and there extensive, low and marshy lands particularly in the vicinity of the mountains, and in the talooks of Bramadshum, Tenkooshie and Calcaud.

The same peculiarity is to be observed in this, as in the Madura Province; that all situations, lying at a certain distance from the hills, are much higher and drier than

* It may here be observed that these immense Ghauts are deeper, that is to say broader in extent from W. to E. opposite to Palamcottah than at any other part of this District; a piece of information which we owe to Major Lambton.

those which are nearer to them; this we had occasion in several instances to remark on our journey from Madura to Cointalum (via Strevulputtore) as well as to note the consequences of it; but more particularly with regard to the villages of Tewancootsie and Culpettie, in the northern part of the Streevulputtore talook. The latter standing in a fine elevated country was comparatively comfortable and healthy, whilst the other, due west from it and close to the high lands, was found nearly surrounded with wet ground, damp, ruinous and almost depopulated.

The principal rivers which water this province, are the Tambarapoornie and Sytaar; the first of these rises from a singular shaped mountain amongst the Travancore Ghauts, situated in latitude 8°35′ Mr. Arthur of the Engineers informs us that no less than three other considerable streams have their sources from hills and run towards the west.

The Tambarapoornie* about 12 miles N. E. from where it first springs forms by its fall the well known and famous Papanassum cataract; after which, traversing a rich and finely cultivated country, it passes within a mile north of Palamcottah whence pursuing its way in a N. E. direction it is joined, at the distance of 9 miles by the Sytaar; after which junction, changing its course to the south east, it flows towards the ocean into which it falls at Pinnacoil.

Previous to the conflux of the Tambarapoornie and Sytaar, the former is joined by several tributary streams; the latter which is the smallest of the two rises in the hills immediately north of Pooliery at the eastern opening of the Ariangowel pass; soon after which, it is united with sundry rivulets. The most remarkable is that which by its fall creates the famous Courtalum† cataracts and which rises amongst the mountains that form the southern side of a kind of recess, which is here produced by the retiring of the great Ghauts and which is celebrated for the salubrity of its climate.

This recess is in width about 20 miles and at its greatest depth, from its eastern opening to the Ariangowel pass into the Travancore country, about half that distance. The pass itself through the hills is very narrow and may be reckoned in length, in a direct line, about 10

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* The Tamborapoornie is about the size of the river Este in Scotland.

† Courtalum is in Latitude 8° 56′.

miles; from its eastern extremity to the western ocean is nearly 40.

Courtallum is not only the name of the Falls* but of a beautiful Shiva pagoda, situated close to them, at the foot of the mountains. This recess, or valley as it is termed, has of late years been sufficiently cultivated, and the hills which bound it on the north, west and south are grand and lofty. The scenery about the pagoda and the falls, is sublime and picturesque, and bears a strong resemblance to some of the most romantic situations in Switzerland, where wood and water, rocks and mountains all combine to aggrandize the landscape.

The greatest height of the lower fall or cataract is nearly 200 feet; there are two others formed by the same stream higher up the mountains but not less beautiful and interesting.

(To be continued.)

ART. III.—*Experiments with Snake (Cobra) Poison.* By JOHN SHORTT, M. D., &c., Surgeon, Superintendent General of Vaccination, Madras Presidency.

(Continued from Vol. IV. p. 432.)

No. 136.

October 1868.—A young goat about 18 months old brought by one T. Ramalingum, weighing 25 pounds, height 20 inches, was bitten by a Cobra at 5 minutes to 12; animal bleated much, is lame, raises the wounded leg, restless. At 12 noon, lay down, breathing hurried.

At 5 minutes after 12, noon, convulsions; 7 minutes after 12, noon, dead. Chest immediately laid open, blood from heart rather dark coloured; I find it coagulated in the course of 3 minutes, and it formed the usual clot in a wine glass; upper surface of clot covered by a bright thin scarlet-coloured layer, bottom dark, serum clear, double the quantity of the clot.

No. 137.

October 1868.—A male full-grown partridge weighing 4 ounces, was injected hypodermically under the right wing at 11-26 A. M. with the following solution :—

Saturated solution of common salt one fluid dram, Cobra poison 3 drops. In 20 minutes, the bird became drowsy

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* These Falls the Hindoos suppose have the power of washing away their sins.

and eventually died with the usual symptoms of Cobra poison at 12 noon. Death in 34 minutes.

No. 138.

October 1868.—A full grown bitch, rather lean, weighing 15 lbs. was bitten by a large Cobra in the left thigh and had Liquor Potassæ injected into several parts of the body, as well as into the wound, and several doses given internally. But the dog was dead in one hour with the usual symptoms.

No 139.

October 1868.—A young ram weighing 38 lbs. was bitten by two Cobras, one after the other, as the wound inflicted by the first was not visible; some native medicines were administered by a native brought by a Mr. Duarte. The same man had administered the leaves to the cat on the 27th October in a previous experiment. This case is alluded to in Vol. IV., page 84 of the Medical Journal under head "Review of cases of snake bite." The animal was dead in 30 minutes.

No. 140.

October 1868.—A second sheep was bitten on the inner part of the left thigh by one of the cobras that had already been used in the experiment No. 130, at 7-54 A. M. Twelve minutes after being wounded some native medicines were given by the same man, at 8-6. The animal began to grow restless, lay down and got up frequently, looking towards the wounded limb. At 9-30 the sheep seemed apparently well and lively again but at 12, convulsions set in. At 1 P. M. it is lying on the side, unable to stand or sit up, breathing hard. At 2 P. M. it was dead. Pupils were fully dilated, weight of carcase 52lbs. As soon as life became extinct, and the weight of the carcase was noted, the chest was laid open, the lungs were found collapsed; heart greatly distended and full of blood. An opening was made into the left ventricle, and as the blood flowed out it was received into a wine glass. Blood fluid, and of a dark purplish colour; on exposure to air, coagulated in 2 minutes, and in 2 minutes more the coagulum began to consolidate, parting freely with its serum. Clot looked firm, and had a thin paper-like layer of scarlet covering on the exposed surface whilst the other parts were of a black colour. The next day the clot was found reduced to a comparatively small size; and the glass contained much serum, about 3 parts of fluid to one of solid.

No. 141.

February 1869.—A solution of cobra poison was prepared. Dried poison 1 grain, distilled water 2 drams, and on being tested with litmus it yielded a neutral action. To 30 minims of the above solution, 30 minims of Liquor ammoniæ were added, which yielded strong alkaline reaction. The mixture is clear showing no change. To this was added 2 drams of distilled water and injected into a dog at 11-20 A. M. Sickened in 5 minutes, and continued so all the night and died at 6 A. M. on the 17th.

No. 142.

The same day, into another dog was injected 30 minims of the cobra solution of the same strength as the experiment No 141, 30 minims of Liquor Potassæ and 2 drams of water at 11-30 A. M. The dog continued well, but was found dead at 2 P. M. of the 20th February 1869.

No. 143.

To a full grown dog weighing 23lbs, on the same day, a similar solution as that noted in experiment No. 141 but diluted with 6 parts of water was injected hypodermically at 10-53 A. M. The dog died with the usual symptoms of poisoning at 1-55 P. M.

No. 144.

February 1869.—No. 1 solution of cobra poison 10 minims, Liquor Potassæ 10 minims, water 30 minims. No. 2 solution of cobra poison 20 minims, Liquor Potassæ 20 minims, water 60 minims were prepared and placed separately in two test tubes. To No. 2 solution is added 15 minims of diluted nitric acid. The mixture effervesced slightly on adding the acid and attained a milky or opaque colour. That of No. 1 is of a brownish yellow, and yields alkaline reaction. No. 2 acid reaction. 15 minims of solution No. 2 injected into a quail under the left wing hypodermically, and 15 minims of No 1 solution injected in like manner into another quail at 12-54. Quail injected with No. 1 solution died in 5 minutes. That injected with No. 2 seems unaffected and quite well.

No. 145.

February 1869. Solution of cobra poison as prepared yesterday, 15 minims, vinegar 5 minims. The cobra solution was neutral. On the addition of the vinegar, acid reaction. 20 minims of the above solution was injected into a quail at 1-40 P.M. The quail was dead at 3 P. M. Experiments from

No. 121 to No. 125 were performed in the presence of Colonel Macaulay.

No. 146.

I castrated 3 goats and a lamb for a friend. On the 12th day the whole four were seized with Tetanus.

No. 1. On this animal before much rigidity of the muscles had taken place, and while the animal was able to stand, ¼ grain of dry cobra poison made into a solution with a dram of distilled water was injected into the neck at 11-20, and the animal died quietly at 12-10. The poison seemed to have no effect whatever on the tetanic symptoms.

No. 2. On the 13th day after castration, animal lying on its right side, limbs stretched out quite rigid. A similar solution of cobra poison was injected into the shoulder at 10-35, at 1-20 the animal was found dead. Died in a couple of hours. No symptoms of the cobra poison were evidenced, nor was there an amelioration of the tetanic symptoms.

No. 3. On the 14th day after operation, animal lying on its right side, legs stretched out in full and as stiff as possible. Head arched forming a curve towards the tail. The whole muscles of the animal as rigid as a piece of board. Injected a similar solution of cobra poison at 11-30, animal dead at 12-55. No effects of the poison were evidenced nor was there any relief of the tetanic symptoms. The lamb was similarly injected with poison, and the symptoms that caused death were the same as previously.

No. 147.

PALAMCOTTA.—*August* 1869. A large powerful dog weighing over 30 lbs. was injected with half a grain of dry cobra poison dissolved in a couple of drams of water at 1-30, P. M. Colonel Dun of the 22nd Regiment Native Infantry administered some native medicine; notwithstanding which the animal became gradually drowsy and died in a convulsive fit at 4-20 P. M.

No. 148.

A pullet weighing 8 ozs. was injected with 2 drops of fresh cobra poison mixed in some blood taken from a dog. The pullet died in 40 minutes.

No. 149.

A Cockerel weighing 10 ozs. was injected with the washings of some cobra poison in a tube at 1-30, P. M. It gradually grew drowsy and died at 4 P. M.

No. 150.

A very large powerful dog was bitten by a fresh Cobra at 2-19 P. M. Two minutes after ½ an ounce of the Acetate of Potash was given it. The Potash was dissolved in water, poured into a piece of fresh inflated sheep's gut, both ends being tied, and was easily forced down its throat. One hour after one ounce of Potash dissolved in 8 ozs. of conjee water was injected into the rectum. This was repeated twice, and subsequently at intervals of an hour each. The dog continued well till the evening when it broke loose, but was brought back the next day at 12 noon, with its head drooping, tongue hanging out and the animal more or less staggering in its gait. It continued thus for about an hour, when stertorous breathing with slight convulsive movements of the extremities set in and at 2 P. M. the animal was dead. These experiments were conducted at Lieut. Francklyne's at Palamcottah in the presence of Col. Dun, Dr. Thompson, Mr. Francklyne and one or two other gentlemen besides a a lot of natives.

No. 151.

September, 1869. RAMNAD.—A large full grown male dog was bitten by a cobra at 7-15 A. M. The Zemindar of Ramnad administered some medicines at 7-18, but the dog died with the usual symptoms in an hour.

No. 152.

Same day and place. A full grown male dog was injected with a solution of ½ a grain of dry cobra poison. 1 minute after the Zemindar administered some medicines internally, scarified the wound and applied the same to it. The medicines were subsequently repeated notwithstanding which the animal died in the course of a couple of hours.

No. 153.

A full-grown cock was injected with the washing out of the syringe at 8-12 A.M.; the bird looked sick at 10 A.M., when it was taken away and the result was not known.

No. 154.

A full grown male dog was pushed before a Cobra let loose on the ground. After some urging, it bit the dog on the left forefoot, 2 points were observed to bleed, at 9-16 A.M. at 9-17 the Zemindar administered medicine. The dog

continued drowsy, staggering, restless, breathing heavily and died eventually in a slight convulsive fit at 9-40 A.M.

No. 155.

As soon as life was extinct in the above animal the jugular veins were opened, and the blood injected into a full grown fowl under the skin of the right wing at 9-50 A.M. The fowl continued quite well and as I was leaving the place the same afternoon, I brought the fowl with me to Trichinopoly and left it at Dr. Duckworth's some three days after. These experiments were conducted at Mr. MacWaters' Head Assistant Collector at Ramnad.

ART. IV.—*Case of a foreign body in the Uterus.* Reported by Mr. R. WARDER, Clinical Clerk of the Lying-in-Hospital.

P———was admitted into the Lying-in-Hospital, under the care of Mr. Cockerill, on the 20th May 1872. Her history is as follows:—She is a widow, 35 years of age, with 4 children, the youngest of whom is 4 years old. Her catamenia had gradually ceased about ten months ago and she had taken native remedies to induce them to return but without success. Three months ago a muco-purulent discharge set in and about this time she noticed a swelling at the lower part of her abdomen which unaccountably changed its position from side to side. She subsequently consulted a native Doctor, who came to the conclusion, that the menstrual discharges had collected in her abdomen and required letting out. He accordingly gave her a medicated *stick,* which he advised should be introduced into the uterus by a midwife. As she was unable to procure a midwife to perform this operation, she, ten days ago, introduced it herself and allowed it to remain ever since. It was not until a week after that its presence caused any serious uneasiness.

Her present symptoms are, slight feverishness and pain at the lower part of the abdomen, extending to the hips and thighs. On digital examination per vaginam, a hard substance could be felt at the upper end of the canal. Sim's speculum was then introduced, and a thin stick was seen protruding from the os uteri, which, extending across the upper part

of the vagina, pressed the posterior wall of it so far directly backwards that the end could not be seen. The whole of the parts were covered with a profuse, offensive purulent discharge.

As an attempt to bring away the stick with a pair of forceps was unsuccessful, Mr. Cockerill partially divided the stick, a short distance from the os, with a curved scissors. The cut part was then siezed hold of with a long vulsellum, and the withdrawal of the stick from the uterus was affected. She immediately after experienced great relief. A plug of cotton dipped in tannic acid and glycerine was then put into the vagina and the patient kept in bed.

The stick was a thin piece of bamboo 4½ inches long and covered for 2 inches with cotton, which, doubtless, was the medium of conveying a local remedy into the cavity of the uterus.

24th May. An examination was made and the parts were all found to be perfectly normal with the exception of a slight hyper-secretion from the uterus and vagina. She was discharged from the Hospital at her own request.

The records of the Lying-in-Hospital contain another case of a foreign body having being introduced into the uterus, but with quite a different object.

Mrs. M. was admitted into Hospital on the 22nd May 1871 under the care of Dr. Harris. She was 5 years married and had 4 children, the youngest eight months old. She presented the following symptoms on admission;—pain at the lower part of the abdomen radiating to the hips and thighs; tenderness of the abdomen; slight tympany; surface generally hot, but hands and feet cold; bowels loose for the past three days and occasionally had vomiting; pulse weak 130; tongue dry and red with patches of white; bleeding from the uterus which began a week ago when large clots were passed. The abdomen was as large as at the 7th month of pregnancy and the breasts were large, with large areolæ, and contained milk.

Examination per vaginam shewed much congestion of the vaginal part of the cervix uteri which was also eroded in parts. A twig of a plant about 6 inches long was found folded in the canal of the cervix and was removed.

Patient was asked to account for the presence of the twig and stated that she was pregnant, and suffering much pain, placed herself under the care of a midwife who introduced the twig a week ago. Bleeding shortly after commenced

and several large clots were passed, but as she did not examine them, she could not say that a fœtus had been discharged.

Her general treatment in Hospital consisted of opium, quinine and iodide of iron internally, and chromic acid to the erosion of the cervix.

She made a gradual recovery which was delayed at times by the occurrence of hæmorrhage from the uterus. Two months elapsed before the uterus returned to its normal size.

ART. V.—*General Hospital Reports.*

A case of Traumatic Tetanus, (under the care of Surgeon Major J. L. PAUL, M. D.,) Treatment by Belladonna. Recovery. Reported by Assistant Surgeon E. F. BROCKMAN, Resident Medical Officer, General Hospital.

MOONOOSAWMY, a cooly, aged 26 years is admitted into the General Hospital on the 20th March with a tonic spasmodic state of the muscles of the trunk, of the extremities and face. Paroxysms of some intensity are said to recur with frequency and to cause a considerable bowing backwards of the body (opisthotonos). Twenty days before he received a ragged wound on the middle finger while at work, and two days ago the tetanic symptoms commenced in the muscles of mastication and of the back. The wound had been treated by native remedies.

On admission the mouth is observed to be opened to a very limited extent and with considerable difficulty; deglutition is interrupted; the muscles of the abdomen are found to be hard and tense. The urine is reported to have been freely voided, and the bowels to be confined. The paroxysms recur on the patient attempting any voluntary movement, during which he complains very greatly of the spasmodic contraction of the diaphragm. On the middle finger on its palmer surface, is an unhealthy lacerated wound of about $1\frac{1}{2}''$ in length and in which no indication of healthy action is present.

Pulv. Jalapæ Co. gr. xx.
Calomel gr. v.
Stat. sumend.

On the action of the bowels, treatment by the Tincture of Belladonna to be commenced.

6 P. M. Bowels acted 4 times after the administration of the powder. At 10-30 A.M., the treatment with Tinc. Belladonnæ was begun by the administration of ten minims in half an ounce of water. At 11-30 A.M. five minims were given, with directions that an increase of three minims of the tincture should be made every hour, until twenty minims were administered at one dose. At 4-30 P. M. this quantity (♏ xx) was administered and continued. The patient in the same state of general tonic rigidity as when admitted.

21*st March* 7 A.M.—The mixture containing twenty minims of the tincture in half an ounce of water was continued until 10 P.M. from which hour it was administered every 2nd hour. Passes urine freely. Rigidity and paroxysms in no manner modified. Pupils partially dilated.

Cont. Tinc. Bellad. ♏ xx.
Unâ quâque horâ.

6 P. M. From 10 A M. the doses of the tincture were increased to ♏ xxv. every hour. No marked improvement.

22*nd March.*—Perspires profusely, vomited a worm this morning. Patient complains less of the muscular pains, and the muscles feel softer. Bowels have not acted since the 20th instant. From 6 P. M., until 10 P. M., last night patient took twenty minims hourly, after which he refused to take any more medicine. Takes his food.

Cont. Tinct. Belladon. ♏ xx. hourly.

23*rd March.*—Took the medicine every hour yesterday. Has taken his food ; bowels have not acted ; has passed no urine since the night of the 21st (?).

Cont. Træ. Bellad. ♏ xx. hourly.
Ice to be applied to head and spine.

Vespere.—Is a little delirious, the Belladonna is to be suspended.

Hydrate Chlor. gr. xx.
to be given in four doses.

24*th March.*—Was delirious during the night, no medicine has been administered. Passed urine. Bowels confined since the day of admission. Delirium has passed off.

Ice to head and spine.
Træ. Belladon. ♏ xxv.
every 2nd hour.

Vespere.—6 P. M. cont. Tr. Bellad, ♏ xx, every hour.

26*th March.*—Perspires freely. Vomited a worm this morning. Passed a bad night. Took the medicine until 10 P.M., and refused three doses at 11, 12 P.M., and 1 A. M. after which he again took it.

Pulv. Jalapæ co. gr. xx.
Tinc. Bellad. ♏ xx, every hour.
Calomel gr. v.
Stat. sumend.
Ice to head and spine.

Vespere.—Bowels acted four times.

26*th March.*—Slept a little last night. Took his nourishment, and medicine ; the latter every hour. Pulse 120.

Rep. pulv. Jalapæ co. gr. xx. cont, treatment.
Ol. Crotonis ♏ i.

27*th March.*—Has continued taking twenty minims of the tincture since the previous morning except for four hours during which time he was asleep. Rigidity of muscles continues. Temp. 101°·8 ; pulse 90.

Ice to head and spine.
Tinct. Bellad. ♏ xx, every hour.

Vespere.—6 P. M., Hydrate of chloral gr. xx. at bed time.

28*th March.*—Slept for two hours during the night. Bowels acted. Took nourishment. Complains of intense thirst, and pain in the chest. Took his mixture every hour. Temp. 101°·2. Pulse 72.

Cont, mixt. Bellad. every hour.
Ice to spine and head.

29*th March.*—Patient is better. Complains of great thirst and pectoral pain. Slept for a short time during the night. Bowels acted once. Micturition free. Took his food, and the medicine every hour. Temp. 100°·2. Pulse full and weak.

Ice to spine.
Cont. Belladonna.

30*th March.*—Patient delirious during the night. Medicine omitted since 2 A. M. Bowels acted once. Temp. 101°.

2*nd April.*—Has continued his medicines from 8 A. M., of the 30th morning. Spasms are very slight. Bowels are acting. Slept five hours during the night. Complains of intense thirst. Took his medicne every hour while he was awake. Temp. 101°.

4th April.—Has continued his medicine since the last notes. His appetite is good. Sleeps. Bowels act regularly. Complains of severe pain in his legs. Pulse 120. Temp. 101°. Complains of intense thirst, and was disposed to be delirious last night.

Cont. medicines.

8th. Slept well during the night. Pain in the legs greatly complained of. Pulse 122. Temp. 100. Tendency to delirium; thirst excessive.

Cont. mixt. every 2nd hour.
Lin. Bell. to be rubbed over legs.

9th.—Pulse 108. Temp. 99°·2.

Ice and Liniment. Cont. mixt. every 3rd hour.

11th.—Slept soundly for eight hours during the past twenty four. Pulse 84.

Cont. mixt. every 4th hour.

15th.—Sat up with assistance on the 12th; can flex his thighs and legs.

Cont. mixt. and liniment.

17th.—Walks about the ward without assistance.

Cont. mixt. and liniment.

21st.—Spasms have not occurred since the 11th. Bowels acting: sleeps well; takes his food.

To omit all treatment.

May 8th.—Discharged well.

Remarks.—This case is illustrative of the tolerance of Belladonna when administered with judgment and with observance of the effects of the drug upon the system. The treatment was begun with ♏ v. with an addition of three minims every hour until twenty minims had been reached. The pupils began to shew a tendency to dilatation on the morning of the day after his admission. On the evening of the 23rd, ten days after admission he is stated to have been partially delirious when the Belladonna was ordered to be stopped. On the morning of the 24th March the delirium is said to have passed off, and the Belladonna in 25 minim doses every 2nd hour is recommenced. On the 28th he complained of intense thirst, and during the night of the 29th March he is again reported to have been delirious. The medicine was omitted, but was again administered on the forenoon of the 30th, and for the third time on the night

of the 3rd April the patient's state shewed plainly the poisonous physiological effects of the drug. The severity of the symptoms of the disease was however much moderated, and from this time the frequency of the administration of the drug was diminished. The patient was under active treatment with belladonna from the 20th March to the 17th April, when all treatment was stopped. From the former date to the 3rd April, the amount of Belladonna taken in the form of Tincture is as follows :—

March	20th	of the Tincture			Drachms	3	Minims	25
„	21st	do.	...	...	„	6	„	40
„	22nd	do.	...	...	„	5	„	20
„	23rd	do.	...	...	„	6	„	0
„	24th	do.	...	...	„	3	„	45
„	25th	do.	...	...	„	7	„	40
„	26th	do.	...	...	„	6	„	40
„	27th	do.	...	...	„	7	„	20
„	28th	do.	...	...	„	7	„	20
„	29th	do.	Ounce	1	„	0	„	0
„	30th	do.	„	...	„	6	„	20
„	31st	do.	...		No notes.			
April	1st	do.	...	...	do.			
„	2nd	do.	Ounce	1	„	0	„	0
„	3rd	do.	„	1	„	0	„	0
			Ounces	10	„	4	„	30

This case clearly illustrates how the system can be brought under the influence of the drug, and how accustomed to its use it can be made.

A case of Phosphatic calculus.

Peter Paul, aged 32 years, a butler by occupation, was admitted into the General Hospital under the care of Surgeon R. W. Cockerill for an elephantiasis scroti which was removed by operation on the 9th November 1870. He was discharged on the 9th February 1871 at his own request before the wound was entirely healed. On the 21st day of of the same month he was re-admitted suffering from a daily recurring fever and with an unhealthy condition of the ulcers of the scrotum. Carbolic acid applications to the ulcers were made, and Quinine administered towards removing the febrile attack.

Two days after admission (23rd February) the record of the case states that after some straining efforts to void urine, a small calculus, phosphatic in nature, which had become impacted, was passed. The fever is reported to have ceased, and the patient was ordered diluted nitro-hydrochloric acid in infusion of gentian. On the 28th recurring fever is reported, but no calculous matter is passed, although the urine is scanty and high colored. On examination of the bladder with a sound no calculus can be found. Quinine is again substituted for the mixture.

From this date until the 13th March, fever returned at irregular intervals, and on the 24th March the student in charge of the case remarks "that the patient has been free from fever for a long time; his health also has greatly improved. The ulcer of the testes is clean and presents a healing appearance."

On the 11th April the record says that "patient complains of a burning sensation during micturition;" and again on the 15th, "complains of soreness, and a feeling of obstruction during micturition. No. 6 gum elastic catheter was passed."

He was finally discharged much relieved and "almost well" on the 17th April 1871.

The next time that the patient seeks admission into the hospital was on the 14th November when he presents the following symptoms. "Constant desire to pass urine, pain in the glans penis; occasional and severe pain in the neck of the bladder after micturition; sudden stoppage in the passage of the stream of water. Urine tinged with blood after violent exercise. Pain in left testicle and spot corresponding to the base of the bladder (pain of a sharp pricking nature). Patient is obliged to rise more than half a dozen times a night to urinate. On examination of the urine the excretion is normal in quantity, with a specific gravity 1020; neutral in reaction; rather high colored; loaded with viscid mucus and deposits a considerable phosphatic sediment. A large number of putty-like calculi of small dimensions were discharged yesterday with the urine, and on admission patient produced about 20 pieces of various sizes from ½ to ⅓ inch in length and a few lines in breadth, to the size of a pea. When the urethra is occluded by one of these, great pain is felt in the loins and inner sides of the thighs, with a general sense of distress. Relief is immediately obtained on the removal of the calculus. The complaint is stated

to be of six months duration, and to have gradually increased in severity.

Acid. nitrici dil. ♏ xv.
Inf. Gentianæ ℥ i
ter in die. sum.—

18*th*.—A silver catheter (No. 12) was introduced, and the bladder washed out with tepid water. A little of the putty like substance escaped through the instrument.

Acid. nitrici. dil. ♏ xxv.
Inf. Gentianæ ℥ \
ter. in die. sum.—

20*th November*.—The sediment in the urine not diminished; no more calculi passed.

Tinct. Ferri. Perchlor. ♏ xv.
Acid Nitrici dil. ♏ xxv.
Inf. Calumbæ ℥ i.
ter in die.

" The patient absconded during the day." On the 7th February 1872, the patient seeks admission, and is re-admitted "complaining of pain in the bladder, and inability to pass urine in a continuous stream." The symptoms from which he was suffering on the occasion of his former admission into hospital having been much aggravated during the past ten days he is compelled to look for assistance. The treatment with diluted nitric acid is again employed, and on the 8th February we find the following notes taken by the clinical clerk." The urine passed was examined, the specific gravity is 1012; it is alkaline in re-action; deposits a thick white precipitate when allowed to stand. It contains a large quantity of albumen, phosphates and mucus. At present patient has fever; temperature 102°·8, pulse 120. The fever set in with rigor yesterday evening and has continued since. Passed urine in very small quantities, not over a tablespoonful at a time; is constantly disturbed at night, having to get up to pass urine. Complains of great pain in the bladder and urethra. A catheter (No. 8) was introduced yesterday; it passed without any trouble into the bladder; urine was drawn off. On tilting it a little, a stone could be distinctly felt, and the sound of a stone in the bladder could also be heard.

12*th*.—Had no fever. Complains of pains about the loins, glans penis and neck of the bladder. Passes urine in small quantities at a time, the stream being suddenly cutshort

by something plugging up the passage. Is constantly disturbed at night by having to get up so often to pass urine.

Cont. Acid mixture.

14*th.*—A sound was introduced yesterday, and a stone could be distinctly felt, but its size could not be ascertained on account of the contraction of the bladder. Some tepid water was injected into the bladder but the size of the stone could not be determined with certainty. On removal of the sound, in order to dilate the urethra, catheters up to No. 10 were passed. A small quantity of pus and blood was found oozing out at the meatus urinarius after removing the sound. The examination of the bladder was attended with considerable pain. The urine passed was examined; its sp. gr. was 1007; alkaline in reaction, and contained albumen and phosphates. A sediment is found when the urine is allowed to stand. It consists chiefly of mucus mixed with some phosphates. The obstruction to the stream of urine still exists. Is constantly up at night to pass water.

Cont. Mixt.

17*th.*—A lithotrite was introduced yesterday evening, and a part of the stone was crushed. Passed several small pieces of the stone in his urine last night; feels much better this morning, pain in the bladder is less. Slept better.

20*th February.*—Absconded from hospital.

For the last time on the 14th April 1872 the patient is admitted into the hospital. The notes of the case in the hospital Journal are as follows:—

15*th April* 1870.—Brought into hospital yesterday complaining of retention of urine, and of constant burning and pricking pain in the urethral canal. He says that during micturition a small quantity of urine at first freely escapes, and that afterwards he is able to pass it only in drops on account of some obstacle which he feels near the vesical end of the urethra. The pain is said to be increased during micturition and to radiate towards the abdomen, hips and thighs.

Has been under native treatment. Has passed no stone since leaving the hospital in February last but has become very weak and thin. His urine is of a brown color, and deposits a thick white sediment which occupies about ¼ of the quantity passed.

Examined with a catheter and the stone detected.

Acid. Nitrici. dil. ♏ xx.
Inf. Gentianæ ℥ i.
every 4th hour.
Opii. gr. i. bed-time.

18*th.*—Symptoms have not been so urgent. Quantity of phosphatic deposit is less. Appetite has improved. The bladder was washed out with nitric acid lotion by means of the double catheter.

22*nd.*—Since the 20th has had attacks of fever. Patient is getting very weak. Diarrhœa has set in.

Opii. gr. i.
every 4th hour.
Mist. Diaphoret. ℥ i.
Tinct. Aconiti. ♏ i.

23*rd.*—Patient suffers daily from severe fever. Complains much of pain in bladder and urethra.

Ammon. Benzoat. gr. xv.
Liq. Ammon. Acet. ℥ ss.
Aquæ. ℥ i.
every 4th hour.
Liq. Morph. hydrochlor. ʒ i.
at bedtime.

24*th*—Does not complain of pain in the urethra so much as he does of that in the *left half* of his body.

Lin. Opii. to painful part.
At 12 noon. Quiniæ Sulph. gr. v.
Acid. sulph. dil ♏ v.
Aquæ. ℥ i.

27*th*—Continued in much the same state, fever recurring every day; the pain in the left half of the body is very much complained of by the patient; the frequent action of the bowels continued, and irritability of the stomach set in. The patient died at 6-15 A.M.

After death, an examination of the bladder only was permitted by the friends. The organ was removed entire, through a limited abdominal incision. On slitting up the

viscus from the urethra a phosphatic calculus, the dimensions of which are as follows, length $1\frac{3}{4}$ inches, greatest breadth $1\frac{1}{3}$ inch, thickness 1 inch and weighing 400 grains, was found within. The mucous membrane was in a state of chronic inflammation. The bladder with calculus *in situ* is at present in the pathological museum of the Medical College.

It is not often that the case of a patient can be followed up so closely as this has been, and less frequently do opportunities occur in which the symptoms which arise from the formation and retention of a calculus can be noted as in the history above given. Among the most curious, and such as we do not recollect ever having read of, were the very severe pains complained of by the patient in the *left half* of the body, pains so excruciating as to cause him to call out when the upper or lower extremity of that side was touched or moved. Litholysis was tried but the patient's sudden departure from the hospital brought to an end a treatment which was evidently doing good, if we may judge from the diminution in the quantity of deposit passed in the urine. The lithotrite was introduced, and the stone seized and crushed. The patient after this operation for the second time absconded from hospital. Fears of a cutting operation appear to have influenced him in leaving without permission. On the last occasion of his seeking relief, the physical state of the patient was so very low as to prevent any operation for its extraction being employed, although the slightest favorable turn in the symptoms of the patient were anxiously looked for to effect its removal. The formation and passage of phosphatic gravel began only after the removal of an elephantoid scrotum (22lbs. in weight) and were ushered in by repeated attacks of fever of a periodic character. The formation of a phosphatic calculus in a comparatively speaking healthy well-made man of thirty years of age is interesting in itself, and the supervention of this condition after an operation on an elephantoid tumor induces us to ask what connexion, if any, existed between the former and latter of these diseased states? If any of the readers of the *Madras Medical Journal* have in their experiences met with cases that bear any similarity to this, it would be useful to record them in the pages of this journal.

MEDICAL CONGRESS IN FRANCE.

THE fourth Session of the *Congrès Médical de France* will commence at Lyon on the 18th September, and will last nine days. The subjects to be discussed are the following :—

I. *Epidemics of variola.*

II. *Gun-shot wounds* with special reference to the primary and secondary effects of modern projectiles on living tissues and to the question of explosive bullets. (2). The indications for expectant treatment, for amputations, and for resections, in fractures through epiphyses and through joints. (3). The best modes of dressing such wounds so as to obviate complications and to allow of the transport of the wounded to considerable distances.

III. *Ambulance service in time of war;* with especial reference to the comparative study of the systems of different nations, the relations of the *chef d' ambulance* to the military commandant, and the connexion between the regular medical department and independent ambulance services.

IV. *Cattle plague or the contagious typhus of black cattle,* information being especially required as to the loss which the last and still raging epizootic has inflicted upon French agriculture in different districts; as to the points of comparison between this disease and other virulent affections, epidemic or epizootic, human or animal, to which it may be analogous; as to the different modes of propagation of the plague; as to the best means of arresting its spread or preventing its recurrence; and, lastly, as to sanitary legislation in force in different parts of Europe with respect to typhus.

V. *The causes of the relative diminution of the population and its remedies*; the question having two aspects, namely, decrease of birth-rate and infant mortality. The former is due to numerous conditions into which the authors of essays will inquire; such as the conditions which discourage marriage or render it infertile, great standing armies for example, excessive luxury, debauchery, alcoholism, &c., &c. Writers will inquire into the influence of maternal, mercenary and artificial feeding of infants, into *crèches*, vaccination, dwellings &c., and compare in these respects the usages of various countries. Practical suggestions for the remedy of these two evils will be expected from essayists.

VI. *The treatment of syphilis.* Are there cases in which not only cure without mercury is possible but even in which it is better to abstain altogether from the use of that metal? On the other hand, should the exhibition of mercury begin with the appearance of the primary symptoms or be deferred until the general concomitants of syphilis are observed? May radical cure be expected from treatment by mercury alone, or should we anticipate only the disappearance of each of the successive outbreaks of which the complete evolution of the disease consists? In the former case how long should curative treatment last? in the latter, do all syphilitic phenomena, isolated or combined, of necessity indicate resumption of mercurial medication as soon as they appear? Is treatment by cutaneous absorption or by hypodermic injection preferable, either generally or in special cases, to the usual method of absorption by the digestive organs? What are the comparative values of preparations of mercury and of iodine? What kind of aid may the physician expect from mineral waters especially the sulphureous, in the treatment of different forms of syphilis?

VII. *The re-organization of the system of education in Medicine and Pharmacy in France.*

VIII. *The practical means of improving the status of the physician and of placing him in harmony with the part which he has to play in society.* Discussion is specially invited upon. (1). The effectual repression of illegal medical and pharmaceutical practice; (2). The establishment of syndical chambers. (3). The regulation on more equitable terms of the relations between the profession and Mutual Benefit Societies.

VACCINATION REPORT FOR 1870-71.

Once again we have been favoured with a copy of this report, and we have once more tried to read it. The report appears to us to be shorter than those of previous years, but in the matter of figures arranged in tables of complexity it is in no way inferior to any that have preceded it. Those who take pleasure in examining tables which exhibit figures in vast intricacy have here ample opportunity of satisfying the cravings of their morbid appetites. Out of the ninety-two pages which constitute this report, no less than sixty-one are devoted to tables of figures, and of the remaining thirty-one pages, seven are occupied by the letter of the Inspector General of the Medical Department to the Government and by the "order thereon."

The Report embraces a period of fifteen months. This results in a change from the calendar to the official year. The Superintendent General is satisfied with the working of the members of his department, although he was compelled to severely notice "the neglect of duty and inattention to orders" in no less than thirteen of the twenty-three Superintendents.

A new plan for encouraging vaccination among the people has been set on foot by the Superintendent

General of Vaccination. Vaccinators have been placed out in the several taluqs according to the number of taluqs and the size of the district, but from not being immediately under the Superintendent's observation, neglect of duty among the vaccinators has necessarily been of common occurrence, and this plan of working has ended in failure. The total number of operations exceeds that of previous years, there being an increase of 17,835.

We notice with pleasure the interest that has been evinced by the Sub-Collector of Salem, J. F. Price, Esq., in lending his valuable aid in extending the operation in his district, but we are disappointed in finding that a difference of opinion should exist between the Sub-Collector of the district, and the Superintendent General as to the matter of supervision and management of the Vaccinators who are paid by the funds raised in the district by the Sub-Collector. We entirely agree with the Superintendent General in his remarks on this point. He says "the Sub-Collector has decided to retain the management and control in his own hands, to which proposal I had no objection to offer; but I fear that Mr. Price's successors may not take that interest which he has done, and it may be left to the native subordinates, who, from carelessness or want of attention, may allow the work to flag, and even bring it into disrepute by improper work, and thus destroy the confidence of the people in vaccination." We think that Mr. Price has undertaken a duty which will eventually prove too much for him, and that he has overstepped the boundaries of his legitimate duties in this matter. A hope can be expressed however, that he may soon be able to correct his mistaken views on the subject.

Difficulty has been experienced in maintaining a due supply of fresh vaccine lymph for arm-to-arm work, and the Superintendent General thinks

"that it will soon become imperative that some legislative enactment be instituted to compel those who take advantage of vaccination to permit the extraction of vaccine lymph." The suspension of the issue of batta "to mothers to permit their children to follow the Vaccinator for the purpose of furnishing vaccine lymph for arm-to-arm operation" was tried, and the Inspector General of Hospitals in his letter to the Government suggests that the stoppage of batta to the mothers has in all probability been the cause of the difficulty complained of in getting and keeping up a due supply of lymph. If we know anything of the native's character it is, that he will never conform to anything from which he finds that he derives no tangible pecuniary advantage; and this feeling in the natives is kept up and encouraged by the fact that in some of the Districts, as the Superintendents remark from their personal observation "almost all the village officials are unvaccinated," and they believe that in this exists the chief reason for their not co-operating with the Vaccinators in their work. This state of things exists in several of the districts from which reports have been received and the question naturally arises why should these Government officials be exempted from producing certificates of vaccination prior to their being entertained in the service, as is required of other uncovenanted servants? No certificates are demanded from the candidates for the Matriculation Examination of the University, and as these under-graduates are eligible for Government employ, no vaccination certificate is demanded of them. This is a question which we think should engage the attention of those whose duty it is to administer the laws.

That the Superintendents and their bands of vaccinators have under these circumstances to contend with difficulties there can be little doubt; but how infinitely augmented must those difficulties become

when opposition and obstruction are placed by a Collector in the way of these men. We find such an account in the report from Kurnool. To briefly narrate the circumstances; — The Superintendent reports to the chief office that a gomastah of a taluq cutcherry obstructed the Government Vaccinators in their work and indulged in obscene language towards them for which the Superintendent prosecutes the goomastah before the Sub-Magistrate and has him convicted and fined. While the case was under investigation, the goomastah and his friends in *open court* used insulting language to the Superintendent, who, returning it, was brought before a Magistrate who dismissed the charge. The Superintendent next complains to the Superintendent General of the difficulties and insults he was experiencing from these petty officials of the Government; the Superintendent General in turn brings the same to the notice of the Collector. In reply the latter complains of the Superintendent as "hasty and hot tempered" &c., and subsequently reports to Government on the conduct of the Superintendent and the backwardness of vaccination in the Kurnool district. We are then informed in the report that " the Superintendent complained of, was in constant communication with the Collector of the district, from whom he obtained a certificate (testimonial) on leaving the district, and it was only after my report to the Collector, complaining of the native officials, that the Collector represented the conduct of the Superintendent to be hasty and hot-tempered, and I consider it my duty to enter thus fully into the matter, and exonerate an intelligent and well behaved young man from the sweeping charge made against him to relieve the native official from blame." The Superintendent General exonerates the Superintendent; but the latter is obliged, owing to misrepresentation, to undergo the discomfort, and no doubt, expense of a removal

to Ganjam to prevent the arrogant native officials of the Collectorate from being inconvenienced. We ask what ideas of justice and what equality of mind can an officer, a magistrate, possess who is stated to have acted in the manner described in the report under review? If the Superintendent General considered it advisable "for departmental reasons," to remove a Superintendent from one district to another; we ask why did not the Collector also consider it right to act in a similarly judicious manner? If the Collector considered the Superintendent to be a man of the character described by him, we ask, how comes it that a report of complaint was sent in to Government about him and the backwardness of vaccination in the Kurnool district, subsequently only to the representation of the Superintendent General, and with what consistency is it that he grants a certificate to the man of whom he injuriously reports? It is not often that we meet with such circumstances in reports submitted to Government as those which we have reiterated at a greater length than we proposed; and we would suggest from knowledge which we have of similar acts of injustice and inconsistency on the part of those vested with collectoral and magisterial powers that some protection should be afforded, and some method of redress be granted to those who are injured by such misemployment of power as that we have considered, and against whose misrepresentation there should be open some means of redress.

DRUNKENNESS IN FRANCE.

The French *Association contre l'abus des boissons alcoholiques* has published some statistics which seem to show that wine-producing countries are not necessarily sober and that intemperance is rapidly

growing in France. In 1820, 350,000 hectolitres of alcohol were consumed ; in 1850, 585,000 ; and in 1869, 978,000 ; these figures, of course, not including the products of illicit distillation. The quality of the liquor has not improved as the quantity has increased. Nine-tenths of the spirits manufactured in France in 1850 were brandies of different kinds ; in 1869 scarcely three-tenths : the remainder being distilled from beet-sugar, molasses, grain and other farinaceous substances. The price of spirits, too, has fallen 75 per cent in 20 years, and the proportion of drinking shops to inhabitants has steadily risen until it is now 1 to 102.

The consequences which the Association attributes to the increased consumption of alcohol are very serious. The annual total of accidental deaths due to this cause is stated to have increased in 20 years from 331 to 587 ; of suicides from 240 to 664 ; and crimes against the person caused by intoxication have increased in the same proportion. Alcoholic insanity has grown with the consumption of spirits, especially of beet and grain spirits. In most of the Departments in which these are distilled the number of cases of insanity attributable to this cause has been quintupled in 20 years and now amounts to from 25 to 40 per cent. There can be no doubt of the need for a society of this nature in France, and we wish it success.

ERBSWURST.

We heard a good deal about this article of food during the Franco-Prussian war and most of the accounts which have since been published are highly favorable to it. It consists mainly of pease flour, to which meat and fat are added, the whole being enclosed in an impervious case, like an ordinary sausage. It is manufactured of two qualities ; a finer, wrapped

in tin foil, and with the ingredients more thoroughly incorporated, for officers ; and a coarser kind intended for the soldier, in which the particles of meat and of fat are distinguishable in the mass of flour, and the envelope of which is skin. The process of manufacture has been carefully kept secret and is carried on only in Berlin ; but some details have leaked out and a paper on the subject has been read before the Agricultural Society of France by M. Laverriere. He says that the peas are first stripped of their outer coat and the meat freed from areolar tissue and fascia and baked, before the two materials are ground and then thoroughly intermingled in a rotatory apparatus. It is believed that the peas are made into a kind of soup and then highly dried before mixture with the meat and fat. Soup is so easily prepared from erbswurst that the materials must be already cooked. In fact eight or ten minutes are enough for the preparation of an excellent and very nutritious dish of soup from this pea-sausage. It is only necessary to heat some water and shake the sausage into it when it boils. The substance breaks up into irregular crumbs and ultimately forms a kind of coarse meal. The water being carefully stirred is heated a few minutes longer and diluted to the strength desired. The flavor of this soup is agreeable and appetizing ; no condiments are required as they have been already added. Salt especially is present in abundance.

Each sausage weighs a pound and one was allowed to three men for a meal. They remained unaffected by changes of temperature. All who have had opportunities of judging of this kind of food agree in strongly recommending it. It is impossible not to wish that a food which contains a large amount of nutriment in small bulk could be utilized in this country when an Abyssinian war or a hill campaign strains the resources of the Transport Department.

Unfortunately since the Nightingale Reaction set in and the British Soldier has come to be coddled instead of poisoned and smothered, encouraged to make complaints about his food instead of expected to eat what was provided for him and hold his tongue, it would be difficult to induce him to try an article of diet so foreign to his appetite and habits.

The author whose communication we have been noticing proceeds to contrast the erbswurst with Liebig's Extract; greatly, of course, to the disadvantage of the latter. Liebig himself, we suspect, would be the last to put forward his preparation to compete as an article of food with the other. The Extract is stimulant rather than nutritive. Its nitrogenous constituents, as creatine and creatinine, have little or no value as nutrients. The saline constituents, amounting to nearly one-fifth of its weight are valuable to a certain extent but poisonous in large doses. Kemmerich states that exclusive feeding on Liebig's Extract is more rapidly fatal than absolute starvation. It is obvious that there is no ground for a comparison of the two preparations.

We may add that Prof. Parkes analysed a sample of Erbswurst and found its per-centage composition to be as follows;—water, 16·2; salts, 7·19; nitrogenous matter, 12·297; fat, 33·65; Starch, &c., 30·663. A ration of six ounces contains two ounces of fat.

MEDICAL FUND ANNUITIES.

We understand that applications for the July Annuities have been registered from Surgeons Major J. Peterkin, M.D., H. T. W. Harper, J. Kirkpatrick, M.D., and W. Aitken, M.D. Two only are available, which will be granted to the senior applicants. Surgeon J. McDonald (retired) has applied for a Sick Annuity, but none will be available until January next.

REVIEW.

The Science and Practice of Medicine. By DR. AITKEN. Sixth Edition. Published by Charles Griffin and Co.

The sixth edition of this now well known work has been produced. We do not remember having ever before seen such a rapid reproduction of any work. Fourteen years only have elapsed since the work was published, and remembering well the earlier editions, we notice a very great difference, and that for the better, in this the last edition. The size of the volumes has been augmented especially with respect to the second; the matter has been re-arranged, subjects from the second volume having been transferred to the first; the type is smaller but is in no way less clear than that in the former editions, and we learn from the author's preface that although "the new material added in the present is equivalent in bulk to a third volume added to the last edition, yet the size of the work is not increased, as a special fount of type was cast to enable the printer to preserve clearness without adding to the bulk of the volumes." Then again the woodcut illustrations are more numerous, and have been carefully executed, and well selected, in some instances from other works.

The second volume we think is too cumbrous and if the material were divided between two books more facilities in reading and in reference would be attained.

The 1st volume is divided into three parts, the first of which treats of "topics relative to Pathology and Morbid Anatomy;" the second of "methodical nosology," and the nomenclature and classification of diseases; the third of the nature and special pathology of disease and therapeutics.

The subject of "Inflammation" is one of the first treated of. In this we find the views of the most recent observers repeated as regards the passage of the corpuscular portion of the blood through the walls of the capillaries, and the changes which they undergo beyond these limits; the pathology of the formation of pus and the pathology of hæmorrhagesis hereby modified, for now we find that pus is a living

material, not a dead fluid, and that hæmorrhages to a very great extent may occur in mechanical congestions without a rupture of the walls of the bloodvessels. The woodcuts which illustrate this section of the work are reprints from Paget and Virchow.

To this succeed the subjects of Hypertrophy and Atrophy. Both these are shortly and concisely treated. We find the author draws particular attention to the difference which exists between a *true hypertrophy*, a *false hypertrophy*, and a *hyperplasia*. To quote a small portion,—"cases in which an enlargement takes place in consequence of an *increase in the number of the elements*, are cases of *hyperplasia*." * * * * "Hyperplasia may therefore be considered as a *numerical hypertrophy*, due to a proliferation or reproduction of tissues similar to the original part, and the condition of the pregnant uterus is thus one of *hyperplasia* rather than genuine *hypertrophy*."

The subject of degeneration follows, and of the albuminoid form we have the fullest and most graphic account. "The London College of Physicians no longer regards this lesion as a degeneration, but classes it with other local lesions as a substantive disease." The author appears not to coincide with this view, and therefore places the history of it, as it was in the earlier editions of his work, among the degenerations. We hold the same views on this subject as the author, and regard the infiltration of any tissue with an albuminoid material as resulting from or as secondary to some pre-existing disease; just as for instance, we find convulsions or an inflammation of the pericardium occurring during the course of Bright's disease, as secondary changes.

The section on "Parasitic Disease" succeeds to that of degenerations. In the fourth edition of this work this article is to be found at the end of the second volume. We think its present position is appropriate. We have no hesitation in saying that this is one of the subjects most ably dealt with in the book. The arrangement in this article of Helminthology is good, and the concise description of the various forms of parasites both animal and vegetable is explicit. The *Trichina spiralis* occupies a large share of the author's attention, the symptoms caused by the presence of this parasite in the muscular structures being furnished to the reader in a lucid manner. He says "the symptoms may be arranged into two sets:—(1) extreme lassitude, depres-

sion, sleeplessness, loss of apetite, and continually febrile phenomena which were well expressed, so much so, that the case was set down as one of typhoid fever; but grave doubts prevailed, and (2) a new train of symptoms developed themselves—namely, the whole muscular system became the seat of excruciating pain, especially in the extremities. Contractions of the knee and elbow joints supervened, and associated with such extreme pain as to render extension of the limbs impossible. Œdema of the legs followed; and the case terminated fatally by pneumonia, about the twenty-eighth or thirtieth day after the first symptoms of illness." The above is given as a summary of the symptoms in a typical case of the kind which occurred in the Dryden Hospital.

The subject of Parasitic diseases generally is peculiarly interesting to us as medical men in this country where animal and vegetable forms are so abundant. We turn therefore with increased interest to the description given of the *Filaria medinensis,* and especially during the months which form the second quarter of the year. It is during this time that those who reside in certain localities of Madras, where the worm is endemic, suffer most severely. We learn from this that the worm found in the mud and clay at the bottom is supposed to be very closely related to the Filaria medinensis. The method of its gaining admission into the body is believed to be through the pores of the skin alone. No treatment is given for its removal or expulsion from the structures of the body.

Among the Sterelmintha or solid worms, full descriptions are furnished of the Tæniæ and the forms of Cysticerci. Eight varieties of the former have been found in man, besides two varieties of the *Bothriocephalus.* Of the former eight, two only are of frequent occurrence, and of these two, the *T. mediocanellata* is most frequently met with in this country, is the larger of the two, and is believed to be derived from partaking of the meat of beef or veal. A description of the various forms of cystic parasites follows. The *Echinococcus hominis* is said " to have extended itself to such an alarming degree (in Iceland) that about a sixth of the whole population are affected with it and that it is attracting considerable attention at Copenhagen. The cause is attributed to the immense quantities of dogs kept in Iceland for the herding of sheep and cattle."

The general outline of fevers is well written, and here is

introduced the use of the thermometer in diseases. The value of this instrument was for the first time recorded in an earlier edition of this work, and in this edition we find a more explicit and delineative account furnished of its value as a means of diagnosis and prognosis. Our author groups together the results of a large number of thermometric observations and demonstrates the utility of noting the rise and fall of the mercury taken in conjunction with the pulse rate and respiratory frequency. Who would not be anxious to possess the power of prognosticating death or probable recovery during the first week of a case of enteric fever, and who would not be proud were he in a position to foretell the advent of hospital gangrene on the granulating surface of a stump? Yet here in the thermometer is a means by which a close observer of disease may be able to become possessed of this much-to-be-desired information. This chapter upon Fever and the usefulness of the clinical thermometer is one that we would recommend to those who have not given their attention to these matters. We are sure that they will rise benefitted from the perusal of this part of the work. We notice however an entire omission of the views entertained by Dr. Lionel Beale on Fever, and the treatment of it,—views which we consider to carry with them a great deal of reason. We would therefore draw the attention of our author to this point when revising the material for the next edition.

The third part of the first volume treats of General Diseases. The diseases which are classed under this head are dealt with in succession in accordance with the arrangement in the "Nomenclature of Diseases" published by the College of Physicians, London. Before however entering upon a description of each disease, the author assigns a few chapters to the consideration of the nature of the specific or general diseases commonly called Miasmatic; the laws to which the action of poisons are subject; the nature of malaria and the fever so-called malarious, the causes and modes of propagation of malaria, and the effects of the poison (malarial) upon the body; to the nature of endemic, epidemic and pandemic influences, and the management of epidemics, and the proceedings which are advisable to be taken in places attacked or threatened by epidemic diseases. In the chapter which treats of the enthetic kind of specific or general disease we find an account of the poison of serpents given. This can hardly be said to be a full, and certain-

ly not a fair record of this subject. Dr. Fayrer of Calcutta, and Professor Halford of the Melbourne university are mentioned as the two experimenters who have of late years done most towards elucidating the action of this poison upon the system. We regret to find also that Dr. Shortt as an investigator into this subject is hardly recognised by the author. Dr. Shortt commenced his experiments on the Cobra poison in September 1866, and it was not until the end of the following year that Dr. Fayrer began his studies and experiments. Further we know that during the month of September of the year following that in which Dr. S. began his experiments, he offered a reward of Rupees 500 to any body who would produce an effective antidote to the action of the poison. So that we may conclude that Dr. Shortt had quite satisfied his mind, by the very varied experiments which he conducted for one year that the discovery of an antidote to the poison was no easy matter. For the past two years an account of these experiments has appeared in the pages of this journal, and is still being published. The author therefore through ignorance of the experiments and the conclusions arrived at by Dr. Shortt states that *no* antidote exists for the serpent venom, a statement with which we beg to differ. That potash neutralizes and renders inert this virulent fluid there can be little doubt after witnessing the experiments conducted by Dr. Shortt, and reading those which he has published. The difficulty which still remains to be overcome is in the application of the antidote so as to rapidly overtake, and destroy the action of the poison in the living animal. We leave for further consideration the remaining portions of this valuable work.

(*To be continued.*)

MEDICAL MISCELLANY.

Small-pox in Utero.

Dr. J. T. Hampton, has forwarded the following interesting note to the *Phila. Med. and Surg. Reporter.*

At 10-30 A.M., Sunday, Nov. 12, 1871, I delivered a woman of a child suffering from small-pox. At the time of its birth the disease had reached the vesicular stage, showing that it had passed successfully through the macular and papular stages in utero. On the morning of the fifth day the pustular stage was reached. Up to this time, and until the morning of the tenth day, the child took nourishment and seemed to be doing well. On the morning following it vomited incessantly, blood gushing from its mouth and nose—the same evening it died. The mother was vaccinated successfully six weeks prior to confinement.—*Medical Press and Circular.*

Galvanic Treatment of Bed-sores and Indolent Ulcers.

Dr. Wm. A. Hammond, of New York, recommends for indolent ulcers and bed-sores, the galvanic treatment as first suggested by Crussel, of St. Petersburgh. He says: "During the last six years I have employed it to a great extent in the treatment of bed-sores caused by diseases of the spinal cord, and with scarcely a failure; indeed, I may say, without any failure, except in two cases where deep sinuses had formed, which could not be reached by the apparatus. A thin silver plate—no thicker than a sheet of paper—is cut to the exact size and shape of the bed-sore; a zinc plate of about the same size is connected with the silver plate by fine silver or copper wire six or eight inches in length. The silver plate is then placed in immediate contact with the bed-sore, and the zinc plate on some part of the skin above, a piece of chamois skin soaked in vinegar intervening. This must be kept moist, or there is little or no action of the battery. Within a few hours the effect is perceptible, and in a day or two the cure is complete in a great majority of cases. In a few instances a longer time is required. I have frequently seen bed-sores, three or four inches in diameter and half an inch deep, heal entirely over in forty-eight hours. Mr. Spencer Wells states that he has often witnessed large ulcers covered with granulations within twenty-four hours, and completely filled up and cicatrisations

begun in forty-eight hours. During his recent visit to this country I informed him of my experience, and he reiterated his opinion that it was the best of all methods for treating ulcers of indolent character and bed-sores."—*Medical Press and Circular.*

Quarantine in Cholera. From a paper read before N. Y. Academy of Medicine. By Dr. T. Walsen.

The literature of cholera is so voluminous, and the history of its Indian origin and prevalence, its migration over the Continent of Europe before it reached America in 1832, is so familiar to all that I cannot presume to refer to it except in its relation to the subject before us—the quarantine of cholera.

The verdict of the ablest writer is "that all quarantine and sanitary cordons are useless." I admit at once the truth and equity of the verdict, unless all intercourse with the locality where the disease prevails as an epidemic, even in a limited form, is absolutely and entirely cut off; for the researches of Pettenkofer, corroborated by our own experience, prove beyond a question, that though persons from an infected locality are invariably the pioneers of the disease, wherever it occurs, they may be apparently in good health when they leave the source of infection, and unconsciously to themselves, or inappreciably to others, be the carriers of the disease. But while admitting this as truth in Europe, and on this continent if the disease has once taken a foothold, I make the assertion with as much assurance, that with a sanitary cordon of 2,000 miles in width, and a lapse necessary for its transit of ten days or even more, *an efficient quarantine* may prohibit and absolutely prevent the introduction of the disease into America.

Before 1832 the records of quarantine exhibit, almost annually, deaths, from "cholera morbus;" but not until the tenth of July of the year named have we any records of Asiatic cholera at the quarantine hospital. The disease had then already become epidemic in Quebec and Montreal. Whether it had been conveyed to this port by the *Henry IV.* from Havre, or whether it had been brought hither by the ship *Carrick* from Europe, arriving on the 1st of June, only a few weeks prior to the *Henry IV.*, I will not undertake absolutely to decide. It is rather ominous that the first two cases were admitted from New York, and not from ship-board.

A brig bound from New York to New Orleans was wrecked on Folly Island, and the passengers and crew, among whom cholera had prevailed previous to the disaster, were taken ashore. The disease extended to the few negroes and wreckers living there; physicians and nurses were sent from Charleston to attend the sick.

In January 1833, a man-of-war arrived at Havana with cholera on board. In February it became epidemic in the town, carrying off over 10,000 persons, or 10 per cent of all its inhabitants.

In 1848 cholera prevailed in Bremen. Unable to procure the desired accommodation, a number of emigrants went to Havre, and thence took passage on the *New York* sailing on the 9th of November. On the 16th cholera first appeared among the passengers from Bremen. On her arrival here in New York, on December 6th, seven had died and eleven were landed sick. The remainder were landed at the public stores. Many were subsequently taken sick, and the disease extended to the hospitals and the surrounding buildings—the first case occurring on the 6th of December in the building nearest to the ward where the female cholera patients from the *New York* had been placed; and on the 8th of December another, in the ward contiguous to the cholera hospital for males; on the 10th of December several cases occurred in the building where patients from the same ship with other diseases had been placed. In all, over 100 were attacked.

In the spring of 1849 a number of vessels arrived with cholera on board, the disease again extending to other patients, over 100 dying. But it was not until May that it made its appearance in New York.

In Boston the *Argyle* arrived from Scotland, with cholera on board on the 4th of June. 600 deaths occurred from the 11th of June to the 13th October. In New Orleans the first case of cholera came from the ship *Swinton*, arriving on the 2nd of December from Havre; and from the 11th of December until the 7th February over 1,200 died.

The fatal consequences that have almost invariably followed the new introduction of cholera during the subsequent years, have not been so appalling as the above mentioned. But the books of the Marine Hospital prove that, in almost every instance when cholera was brought here from ship-board, the disease spread among the sick inmates nearest to the wards containing the patients, and more than once decimated the hospital in its fearful progress.

In 1858 the quarantine hospitals on Staten Island were destroyed by a mob, and the port of New York remained exempt from a visitation of cholera until 1866, when the *Atalanta* arrived from Havre, reporting 60 cases and 15 deaths from cholera during the passage, and having 21 sick with cholera on board. These, and 23 other cases which occurred while the vessel and passengers were at quarantine were sent to the Floating Hospital. Thirty days subsequent to her arrival, and 10 days after the occurrence of the last case, the vessel received pratique, and no further cases were reported either among the passengers dis-

charged or the employés of the hospital. About the same time cases of cholera occurred on vessels arriving from the same ports; but the disease again disappeared before they reached New York. It is, however, remarkable that the disease, on these vessels at least, could be traced to the same hotel in Havre; all parties corroborating the statement that several persons died of cholera while the passengers who became the first victims on the different vessels boarded there.

If, then, as clearly proved by the facts before us, cholera never appeared here except when brought from abroad; and persons were invariably the carriers of the disease, both to the vessel and from the vessel to the shore, *the quarantine of cholera is a quarantine of persons*, and the virus, reproducing the disease, is the *personal elimination* of the cholera patient, but differing from the virus of small-pox and typhus—both eruptive diseases—in not being the eliminations of the skin but of the alimentary canal.

The "Floating Hospital" used on the emergency of the arrival of the *Atalanta's* passengers was, for the purpose, certainly preferable to the hospital on Staten Island; for not only was their isolation more perfect and the danger of communication to convalescents or sick of other diseases, especially typhoid, avoided, but the dejections of the cholera patients, incontrovertibly the principal receptacle of the morbific agent, and the generative principle of the disease, were cast into the sea, and with them all danger of infection and communication was avoided. The buildings on West Bank, lately erected, may offer greater facilities and comforts, but scarcely as much security. The well passengers of cholera-infected vessels may be divided into two classes: the first, where the disease already exists, but the patient suffers merely from a colliquative diarrhœa, scarcely more than a matter of inconvenience to him, but equally morbific in its agency as the dejections of a cholera patient in a state of collapse; the second class, merely the subject of the incubation of the disease, but in whom no development has as yet taken place, comprising, of course, all the passengers exposed to the morbific agency of the disease. For this class, the buildings on West Bank are most admirably adapted. The time of quarantine may be fixed at 10 days after the occurrence of the last case, being three days longer than the accepted period of incubation. Though this may seem long, we must not forget that a single case may be the cause of an epidemic, as clearly proved by Pettenkofer, in the history of cholera at Altrau, in 1865, when the disease was introduced by a lady direct and only five days from Odessa; in Thoyden Bois, in England, by a gentleman from London, and in our hospitals, by the arrival of a single cholera patient from Aspinwall.

The quarantine of merchandise may be safely reduced to the quarantine of merchandise soiled by the dejections of cholera patients, and to personal effects. Dr. Simpson relates a case of the transmission of the disease by a chest of clothing from a cholera patient, aided perhaps by the use of unwholesome food contained in the same chest. That the disease in the Marine Hospital almost invariably attacked others in the same building or in the adjacent ones, may be explained by the fact that the soiled linen of cholera patients was placed in a building attached to the watercloset, and allowed to remain there for days, these being only a few feet distant from the shanties used for the reception and treatment of the cholera patients.

The disinfection of the clothing and rags, the only merchandise which properly can be soiled by the dejections, can be effected by ventilation, fumigation, and submerging in a solution of the sulphate of zinc, or, better still, of carbolic acid. How long such effects may retain the cholera virus is rather a matter of opinion than of positive demonstration, and if effects infected with the cholera virus may be disinfected by exposure and ventilation, and if cholera effects disinfected in this way may eliminate the morbific virus, through our own medium, the air, the most pertinent question is the distance to which such morbific agent may be carried. In answer I may cite the theory of Mr. Simon, that the cholera germ diminishes in ratio to the square of the distance from the point of emission. Certainly no case has come under my observation, where the germ was carried more than 200 feet, and the hospital on West Bank offers, therefore, the desired security.

The quarantine of vessels, after the discharge of the passengers, and thorough fumigation and washing by a solution of carbolic acid, is scarcely necessary beyond the time required to do this; and the first instance has yet to be adduced where the infection could be traced to vessel or cargo.

In speaking of the quarantine regulations, I have treated the subject as my long experience and familiarity with the practical workings of quarantine demand; and in presuming to make suggestions before the Academy of Medicine, I invite their deliberations to questions which can only be decided by men of science, and thoroughly familiar with the mode of propagation of each disease. The community looks to the profession as its legitimate guardians, and the merchant for relief from exactions and impositions.—*The Medical Record.*

Killed and wounded.

To present the losses in killed and wounded in battle is to indicate a very sad and terrible picture, and although we are per-

haps not even yet in a position to record the full extent of the losses in the last great struggle, the particulars in our possession give some idea of what they were.

Going no further back than the beginning of this present century, we would enumerate a few of the great battles, and note the cost of human life in each. At Marengo, in 1800, there were on one side 28,000 French, on the other, 30,000 Austrians, or 58,000 in all, of them 43,000 were killed or wounded, or in other words 74 per cent.; at Austerlitz, out of 90,000 French, 80,000 Austro Russians, or a total of 170,000, there were killed and wounded 23,000; at Jena, 100,000 French, 100,000 Prussians, total 200,000, the killed and wounded were 34,000; at Wagram, 150,000 French, 130,000 Austrians, total 280,000, killed or wounded 24,000; at Moskova, 125,000 French, 125,000 Russians, total 250,000 men, killed and wounded, 80,000. At the battle of Lutzen, 1813, where 96,000 Russians and Prussians were engaged against 120,000 French, the allies lost 10,000 men, and the French 15,000; at Bautzen, 96,000 Russian and Prussians were opposed to 130,000 French, the allies lost 18,000 including 6,000 dead, the French 25,000, of whom 8.000 were killed. At Dresden, there were 200,000 Austrians, Russians and Prussians, against 100,000 French, the allies lost 15,000 killed and wounded, and 23,000 prisoners. At Leipsic, 300,000 allies fought and 171,000 French; in the first day of the battle, October 16th, 1813, the regiments actually engaged lost one-half of their men; one regiment, the 7th Landwehr regiment of Silesia, was reduced from 1,800 to 160 men, and during the three following days, the allied army lost 45,000, the French 30,000, of whom 15,000 died. At Waterloo, 68,000 French, 67,000 English, 136,000 men; killed or wounded 14,000. Coming down to more recent times, let us note that, during the Crimean war, the actual losses in men amounted to 256,000 Russians, 107,000 French, and 45,000 English; that the Polish insurrection cost 190,000 men, that the African wars of France have since 1830, cost the latter more than 146,000 men and that the Italian war caused the loss of 59,064 lives of Austrians, 30,220 French, 23,611 Italians, 14,000 Neapolitans, and 2,370 soldiers of the Pope. Again, at the battle of Konigratz, the wounded in the Prussian army gave a per centage of 4·90, and in the Austrian, 9·28; at Magenta, 6·7 of French, and 7·05 of the Austrians; and with regard to the civil war in America, the per centage of the Federal army wounded at Shiloh was 12·51; at Chattanooga, 18·22; at Gettysburg, 11·68; at Wilderness, 19·29; while in regard to the Confederate forces, the proportion of casualties was still greater.

Full particulars are still wanting as to the actual casualties in the opposing armies during the Franco-Prussian war. From such records as are available however, we gather the imperfect

statements which follow. Thus, the losses of the French in killed and wounded are said to have been approximately at Forbach, Woerth, and Gravelotte, 26,000; Sedan, 16,000; Army of the Loire, 22,000; Bourbaki, 7,000; Faidherbe, 4,000; different sieges, 2,000; Paris, 17,000; altogether 89,000 killed and wounded. These figures, however, can only be considered approximate.

After the battles of the 29th and 30th November and 2nd December, 1870, at Champigny, the returns given enumerate the losses at 72 officers killed and 342 wounded, and 936 soldiers killed, and 4,680 wounded, or a total of 1,008 killed and 5,022 wounded, the strength engaged being estimated at 70,000 men; as with the previous figures, however, these are believed to be approximate.

The entire losses of the German forces during the late war, give the following figures of officers and soldiers, namely, officers dead. 1,165; wounded, 3,795; missing, 30; total, 4,990; soldiers dead, 18,131; wounded, 87,742; missing, 6,165; total, 112,038. According to returns published at the time the losses of the troops belonging to the North German confederation, exclusive of Saxony and Baden, namely, general officers, 2 dead, 13 wounded; staff officers, 67 dead, 177 wounded; other officers, 724 dead, 2,375 wounded, 36 missing; cadets and subofficers, 1,394 dead, 5,916 wounded, 274 missing; soldiers, 10,622 dead, 51,153 wounded, 6,875 missing; almoner, 1 dead, 1 wounded; infirms 16 wounded, 31 missing; total, 12,814 dead; 59,738 wounded; 7,250 missing; or a grand total of 79,802 officers and soldiers. The Guard and Landwehr corresponding, lost 412 officers, and 9,536 soldiers, besides 335 soldiers missing.

The greater portion of the above losses took place in the early part of the war, and by a statement published at the time the actual losses of the German forces to the middle of October, 1870, included the following, namely, 498 officers, of whom 48 were of the Reserve, 28 Landwehr, and 2 retired, all of whom fell on the field of battle; 232 officers died of wounds, of whom 21 of the Reserve, and 16 of Landwehr; 42 officers died by disease, of whom 2 of the Reserve, and 6 of the Landwehr. This makes a total loss of 772 officers, of whom 71 were of the Reserve, 60 of the Landwehr, and 2 retired.—*The Doctor.*

The Application of Cold in Fever, (*from* Dr. Beales' "American Practice of Medicine.")

"According to Sir John Chardin, the celebrated traveller, the Persian physicians (devoted followers of the Galenical school)

had frequent recourse to bathing in febrile diseases. His own case particularly is a remarkable example of their practice.

"He had with him a French surgeon, who gave him every assistance in his power during the violent remittent fever with which Sir John was attacked; but on arriving at Laar, they concluded to send for the governor's physician. The latter, on his arrival, stated the nature of his disease (the fevèr of Bender, or bilious remittent), and, contrary to the gloomy prognostics of Sir John and his professional friend, promised a speedy cure. Chardin called out, 'I am dying of heat.' 'I know it,' said the physician, 'but you shall soon be cooled.' Chardin says:—'The apothecary, who paid me the most constant attention, then procured two buckets of water, and having placed me on a chair, on which I was supported by two men, poured the water over my body, little by little, from the haunches downwards, and then taking a large bottle of rosewater, bathed in the same manner my head, face, arms, and breast. I blessed in my heart the Persian practice of medicine, which treated sick people so voluptuously. But our French surgeon, who was always by me, could not contain his indignation.' 'He is killing you, sir,' said he to me, in a compassionate tone. 'What! bathe you with cold water in the heat of a malignant fever; with a pint of emulsion, two pints of decoction, and a pound of confection in your belly; with I do not know how many draughts of snow-water? Depend upon it,' he continued, 'that instead of being very soon without fever, as he has promised you, your death will be the end of the business.' 'I do not know what will happen,' I answered, 'but, at any rate, I do not feel as if I were about to die, as you suppose.' 'Indeed, at that moment, I felt the heat within me diminish and my senses return; upon which my apothecary, having felt my pulse, said, 'Your fever is abating.' 'It went off from that time so quickly, that by one o'clock in the afternoon I was quite free from it, even in the opinion of the French surgeon. He was quite astonished, and I was transported with joy."—*Medical Press and Circular.*

Vaccination during the fever stage of Variola. By J. H. Tyndale, M.D., House Surgeon, German Hospital, N.Y.

Previous to the great discovery of Sir Edward Jenner, towards the close of the eighteenth century, the rate of mortality from small-pox was enormous, and is estimated to have reached fifty per cent. Moreover, the symptoms and course of the disease were of a more aggravated character. No wonder then that efforts had been made from the earliest periods to mitigate the out-breaks

of the epidemic by preventive measures, as well as by the administration of remedies.

When and where inoculation originated is not known. From time immemorial the Chinese have practised a method of "sowing or disseminating" the disease, which consists in introducing the scales of the eruption into the nostrils. At a very remote period, in Hindoostan, a tribe of Brahmins resorted to it as a religious ceremony. A small incision was made, and cotton soaked in the virus applied to the wound. Offerings were devoted to the goddess of spots to invoke her aid; this divinity having first hinted at inoculation—"the thought being much above the reach of human wisdom and foresight." But the merit of introducing the practice into England, from Turkey, is due to Lady Mary Wortley Montague. Writing from Adrianople, in April, 1717, she observed: "Every year thousands undergo this operation; and the French Ambassador says pleasantly that they take the small-pox here by way of diversion, as they take the waters in other countries. There is no example of any one that has died in it; and you may believe I am very well satisfied of the safety of the experiment, since I intend to try it on my dear little son. I am patriot enough to take pains to bring this useful invention into fashion in England." (The Letters and Works of Lady Mary Wortley Montague, third edition, vol. i., p. 309. London, 1861.)

The debt which our ancestors owed to this lady is not diminished by the fact that inoculation had been practised for very many years in South Wales, where it was known as "buying the small-pox;" for this circumstance only became generally recognized as Lady Montague's views engaged attention, and while she enjoyed the privilege of being the best-abused person in England.

It has been calculated by the Registrar-General of England, that the average number of deaths annually occurring from small-pox in London during the years 1660-79, were 357 to every 100,000 inhabitants, whereas in 1859 they were 42 only for the same proportion. Later statistics have reduced this proportion still further.

But even the most palpable evidences of the benefits of vaccination have never sufficed to quell the opposition to it. Statistics have been published, laws passed and enforced, and still the voice of opposition is as far from being stifled as it was nearly one hundred years ago. It is even at present so vehement that intelligent physicians have entered their protest against vaccination as utterly ineffective. The press has also to some extent endeavored to establish the futility of the enforcement of the measure. To defeat this broad assertion nothing is needed but a reference to the statistics of any country, since the introduction of vaccination.

Some of the objections urged seem at first glance to be quite reasonable; but on closer scrutiny it will be found that all are based upon false presumptions, and consequently worthless.

It has been argued: 1st. That the prevention was worse than the disease; the dissemination of the poison throughout the body was paramount to an introduction of the disease itself, the consequences whereof could not be calculated. While it is true that the poison is intended to be and is disseminated throughout the system, it must be remembered that the constitutional disturbance caused by the introduction of the virus is of the mildest character, and never productive of evil results. On the other hand, the benefits derived from it are immunity from the disease for a period of from seven to ten years, and certain immunity at the time of an epidemic, as my experiments, to be spoken of hereafter, will conclusively prove.

A second objection is the possibility of engrafting upon the constitution such diseases as syphilis, scrofula, etc., by means of virus taken from persons afflicted with these diseases. There can be no doubt that by the use of a foul lancet pyæmia has been caused, and abundant evidence exists of the fact of syphilis having been communicated by vaccination. The use of a dirty lancet can, of course, and ought to be avoided. As to the introduction of syphilis and other blood contaminations, Dr. Viennois, in an exhaustive paper upon the subject (*Archives Générales de Médecine*, vol. i., p. 641; vol. ii., pp. 32, 297; Paris, 1860), has come to the conclusion that if the lymph from a vaccine vesicle alone be introduced, the cow-pox alone will be introduced; but if in addition the blood of a person afflicted with syphilis be also inoculated, then syphilis will likewise be communicated. At the present period, lymph from the vesicle is almost universally employed, a fact to which I will refer again hereafter.

The third, and perhaps most plausible objection, is the uncertainty of a fixed period of immunity. The term of immunity is variously estimated at from seven to ten years, after which time the protection is supposed to have lost its power. Prof. Felix von Niemeyer, lately deceased, had instituted inquiry in that direction, and promised a treatise upon the subject at some future day. The work may have appeared lately but has not come under my observation. Niemeyer feels justified in concluding in advance that vaccination is at all times necessary during an epidemic. Now in a city like New York, and all large places, small-pox never entirely disappears, and an epidemic is only spoken of when the cases are multiplied beyond the ordinary number. It is at such times that our health authorities, ever watchful of the welfare of their fellow-citizens, issue orders for the disinfection of affected neighborhoods, and urge the people to permit themselves to be vaccinated. Perhaps compulsion

would be a better course. And then it is that the question arises, not only whether previous vaccinations will procure immunity, but whether the same now performed is to be considered a perfect safeguard during the present epidemic. There is often doubt in the minds of persons, coming in contact with the small-pox, who have subsequently been successfully vaccinated, whether they would not have escaped the disease without being vaccinated. This is in a great measure encouraged by the assertions of those who have been, or imagined themselves to have been, in contact with it, and providentially escaped infection either without previous or present vaccination. The escape is generally credited to an abundance of moral courage. This induced me to ascertain whether, after a positively decided contagion has taken place, and, the period of incubation being passed, the fever sets in, it would then be of any avail to vaccinate. And the results more than fulfilled my expectations. An epidemic of small-pox, which broke out in the city of St. Louis, and continued for three or four months, furnished the necessary material. While I was acting in the capacity of public vaccinator, a young man presented himself for admission into the hospital, suffering from all the preliminary symptoms of variola. He stated that he had been nursing his brother, then lying sick with small-pox, for the past twelve days, relying for protection against the disease upon vaccination performed in his childhood. For the past forty-eight hours he had high fever, with intense frontal headache, well marked pain in the back, swollen tonsils, and, in short, every premonitory symptom of variola. I vaccinated him carefully, and sent him to the hospital to await the result.

On the following day (expectant treatment having been followed) the fever, headache and pain in the back had abated. An elevation at the point of vaccination and a slight redness indicated the success of the inoculation. The patient felt perfectly comfortable. The vesicle gradually dried up and fell off about the eighteenth day. No further symptoms were experienced by the patient. In order to fully satisfy myself of the truth of my patient's statement I called on his brother and found him in a convalescent stage of variola, the pustules having mostly broken and formed scabs.

The success of this case encouraged me to put my hypothesis to a still further test. During the course of the epidemic, eight other cases of the same nature presented themselves, the details of which are not necessary to describe. Suffice it to say that in each and every case the contagion was fully established. The result in each case was precisely the same as in the first case related above. In two cases the fever stage had lasted fully two days, as in the first case. In the others the fever had continued from twelve to thirty-six hours.

In one case only, the result was unfavorable. The fever in this instance had continued for nearly three days, when the inoculation was performed. A few hours later the eruption made its appearance all over the body, and the case proved a discrete one. I can scarcely assume that vaccination exercised any modifying influence, since no vesicle was reported to have made its appearance (the patient being under the care of another physician), yet the possibility of such an event cannot be denied.

As regards the modus operandi of the virus at this stage, I cannot look upon it as different from that of an ordinary vaccination. A good absorbing surface being produced, and the virus introduced in a state favorable to absorption, it is readily carried into the circulation. Capillary circulation being very active during the fever stage, as evidenced by the thermometer, seems to me to favor the absorption of the virus. This may in some measure account for the unusually rapid appearance of the vesicle. It is not my intention to speculate with regard to the action of the virus in the system. Whether it acts as a ferment, or, in some manner unknown, attracts the poison within the system to that particular spot, are mere matters of speculation. It is a well-known fact that counter-irritation, as for instance the application of croton oil to some particular part of the body, as the chest, has the effect of determinining the eruption to that neighbourhood.

If we choose to consider a local point of irritation a favorable spot for the eruption, the question will be solved as far as speculation can solve it. The fact that at that point the skin has been removed and the corium exposed, will render the spot a "locus minoris resistentiæ" for the eruption.

I think that the results of these experiments will justify me in calling the attention of the profession to them. My excuse for presenting so limited a number of cases, lies in my inability to put it to a further test, owing to want of material. Nevertheless, I do not hesitate to affirm that *vaccination, properly performed, previous to the exacerbation of the fever on the third day, will cut short the disease, by quickly relieving the general symptoms of small-pox and causing a well-marked eruption on the spot inoculated.*

It must be borne in mind that the fever accompanying variola is of a remittent type, and, like all remittent fevers, has its highest range of temperature in the evening. The third, and usually the last exacerbation, is also the most severe (marking the highest temperature), and quickly followed or rather accompanied by the eruption. Vaccine virus introduced during this last remission will scarcely have time to be absorbed, though it is possible that when absorbed it may mitigate the character of the eruption. Of this, however, no positive proof exists, and it is merely mentioned as a possibility, if not a probability.

In inviting the attention of my colleagues to this important matter, I cannot refrain from requesting a strict observation of the ordinary cautions in further testing the results of vaccination during the fever stage of variola. That the virus should be pure, unmixed with blood, and not too old, need scarcely be mentioned. For my part I have found the recently dried scab, exclusive of the inflammatory products on the periphery, rubbed up carefully with a drop of water or glycerine to a creamy consistence, to answer the purpose admirably. Various ages and various physicians have had their own peculiar method for introducing the virus, either by punctures of the skin or by scraping away the cuticle. Punctures of the skin, whether performed by the lancet, a pin or some instrument invented for the purpose, are open to two objections. In the first place, the puncture will close immediately upon the withdrawal of the instrument. Even when the virus is introduced with the puncturing instrument, the application is too sudden to insure absorption. In the second place, it often occurs that, notwithstanding proper care is taken, blood will follow the puncture. Extravasated blood is very slowly reabsorbed, and therefore a hindrance to absorption of the virus when the latter becomes mixed with it.

In my opinion, scraping of the cuticle with a dull lancet until the corium is exposed, is, although a more laborious, a far more certain method. The first appearance of moisture on the scraped spot is an indication of having reached the proper absorbing surface. It is well not to be too sparing in the application of the virus, but to spread it upon the absorbing surfaces (for there should be two) as thickly as possible.—*The Medical Record.*

Digitalis an Anaphrodisiac.

M. Gourvat, in the course of a paper published in the *Gaz. Mèd. de Paris*, on the action of digitalis, says: "When digitalis, or digitaline, is administered for some time to a man in full possession of sexual powers, these become gradually weakened, the propensities disappear, formation of the liquor seminis diminishes, and may at last cease altogether. The anaphrodisiac properties of the drug are the secret of its good effect in spermatorrhœa. With women, digitalis or digitaline excites strong, regular and intermittent uterine contractions, and controls metrorrhagia; hence digitalis is employed in producing abortions. (Tardieu.) It is probable that this drug acts as an anaphrodisiac in women, inducing, by long continued use, impotence and sterility, appearing also, in their cases, to interfere with the development of the Graafian vesicles; the propagation of species being thus doubly retarded.

Pagliari's Hemostatic Water.

This preparation is very valuable in cases where the arteries are friable, where we are unable to seize a broken artery without multiplying incisions, when we have to deal with small retractile arteries, and when we have to meet venous and capillary hemorrhages. Rolls of lint soaked with this water placed in contact with the wound arrest the hemorrhage and form an excellent substitute for pressure which is always more difficult and painful of application.

The Roman chemist Pagliari makes no secret of the preparation which bears his name. It is made thus:

Balsam of benzoin	250 grams.
Sulphate of alumina and potash...	500 „
Water	500 „

Boil together for six hours in a glazed earthenware vessel, stirring the resinous mass continually; and replacing the water lost by evaporation with warm water, so as not to interrupt the boiling. Filter and keep in well-stoppered glass bottles. The undissolved portion of the benzoin will have lost its peculiar odour and its inflammability.—*Jour. des Conn. Méd.*

Quantitative Analysis of Urine. By Dr. Jacquème.

Physiology has taught us that urine is a liquid purely excrementitious, separated from the blood by the kidneys. It clears the body of all products the accumulation of which would interfere with and even arrest the functions of the organs. Urine contains, besides water, saline principles and nitrogenous matters arising from the transformation of protein or quaternary elements. It contains, so to speak, the ashes of organic combustions the result of which is life. Of these principles, some return directly, after serving their purpose, to the mineral kingdom from which they were derived; others, still retaining combustible and living elements, generate spontaneously inferior organisms, vibrios and infusoria, which destroy them and change them into mineral principles. In all diseases, the urine includes morbid substances which are either their results or their causes—substances which must vary with the nature of the disease, but which our coarse and incomplete means of analysis do not allow us to distinguish.

The study of urine was neglected for a long time on account of the ridicule which the uromaniacs had drawn upon themselves. These charlatans, assisted by the ideas of Van Helmont and Paracelsus, surrounded themselves with mystery and prognosed the nature and duration of a disease according to the

color and odor of the urine. But at the beginning of this century, owing to modern investigations and the progress of chemical science urology rose to the same level as other methods of chemical research. We are justified in hoping that, spite of the extravagance of certain chemical physicians of our day, this method will not again fall into the same discredit as too hasty attempts at generalization caused the observations of past times to undergo. My firm conviction of the importance of this study to the clinical physician induces me to publish the method of analysis which I have employed for two years in the Paris Hôtel-Dieu in M. Behier's wards. The plan is simple and within the reach of every medical man.

I. The analysis should be applied to the urine of 24 hours.

1. Note the volume, the density and the reaction.

2. After having weighed in a capsule about four grams of the urine evaporate rapidly in a sand-bath, or (better) in the stove. Take care to put the capsule, cooled, on the balance several times, until it ceases to lose weight. Note the result; and, by a simple subtraction, the weight of the residue tells the proportions of water and of solids in the urine.

3. Wash the residue in the dish five or six times with absolute alcohol, decanting very carefully after each washing. This operation gives (*a*) a residue and (*b*) an alcoholic solution.

4. The residue includes mineral matters—chlorides, phosphates, sulphates—and the less highly oxidized organic compounds—uric acid, creatine, extractive matters or albuminoid substances insoluble in alcohol. This residue is dried on the stove and weighed. It is next calcined in the capsule at a low red heat so as to burn off completely the organic constituents, and to reduce the residue to a white mass. The weight of the latter represents the quantity of fixed mineral matter in the urine. A subtraction gives us the weight of organic matter insoluble in alcohol, which we shall call "insoluble extractive matters."

5. The alcoholic solution is evaporated to dryness. The residue is weighed. The sums of this weight and that of the previous residue ought to be approximately equal to the weight of solid matter found at the beginning. The residue from evaporation of the alcoholic liquid contains the urea and extractive matters soluble in alcohol, the more highly oxidized organic compounds. Add one or two drops of pure nitric acid, the extractive matters are destroyed and the urea converted into nitrate. The thick magma which results is collected on a piece of filter-paper, folded several times and washed by pouring on it some drops of nitric acid saturated with urea. Dissolve the nitrate of urea in a small quantity of water, in a capsule; evapo-

rate the solution and weigh the residue which represents the weight of the nitrate of urea. 100 parts of this nitrate contain 48·7 parts of urea. The difference between the weights of the urea and the alcoholic residue represents the weight of *soluble extractive matters.*

By this procedure, with a small quantity of urine we determine (*a*) water, (*b*) soluble extractive matters, (*c*) insoluble extractive matters, (*d*) urea, (*e*) mineral matters. These data are sufficient to explain to the physician most of the symptoms presented by diseases. If the urine contained sugar or albumen, these substances should be determined separately, remembering that both are insoluble in absolute alcohol.

II. To estimate the mineral constituents evaporate about 300 grams of urine in a dish, calcine the residue, being careful to add nitric acid in order to destroy completely all organic matters. Dissolve the result in acidulated water and divide the solution into three equal parts by means of a graduated burette. The first part enables us to estimate the *lime* and *magnesia*; the second, the *phosphorus*; the third, the *sulphur*, the *potassa* and the *soda.* The *chlorine* is estimated separately by a method which we shall describe farther on.

Lime and *magnesia.*—To the first portion of the solution add ammonia drop by drop until a precipitate appears, which redissolve with a drop of hydrochloric acid. Then add solution of oxalate of ammonia in excess, and allow the precipitate to subside, collect the oxalate of lime on a filter and wash with hot water. Calcine in a platinum crucible, taking care to add, at the end of the calcination, one or two drops of sulphuric acid, to convert the carbonate of lime into sulphate which is not decomposable by heat. Multiply the weight of sulphate of lime by 0·4118; the result is the weight of oxide of calcium contained in the urine.

The filtrate is evaporated, after the addition of hydrochloric acid in slight excess; and from it the magnesia is precipitated as ammonio-magnesian phosphate. Muriate of ammonia and ammonia are added to the acid solution. If it becomes turbid the precipitate must be carefully re-dissolved by means of slight excess of muriate of ammonia. The clear liquid is then mixed with a solution of phosphate of soda. Immediately, or after agitation, a crystalline precipitate of the ammonio-magnesian phosphate is formed, which is allowed about 24 hours to deposit. It is then collected on a filter, washed with cold distilled water containing a little ammonia. Calcination of the precipitate (with the filter) converts it into the pyrophosphate of magnesia. $Mg\ O, NH_4O, PO_5 = NH_4O + 2\ Mg\ O, PO_5.$ The pyrophosphate multiplied by 0·3661 gives the weight of two equi-

valents of oxide of magnesium. This weight divided by 2 gives the weight of magnesia contained in the urine.

Phosphorus.—To the second part of the liquid alcohol and a slight excess of sulphuric acid are added; the lime is precipitated and separated by filtration. The filtrate is distilled to get rid of the alcohol and a mixture of sulphate of magnesia, muriate of ammonia and ammonia added to it. The phosphorus is precipitated as ammonio-magnesian phosphate, 24 hours are allowed for its deposition, it is then collected on a filter and washed with distilled water and ammonia. It is converted by calcination into pyrophosphate, which multiplied by 0·634, gives the weight of phosphoric acid; and this multiplied by 0·437, represents the weight of phosphorus required.

Sulphur. Potassa. Soda.—To the third portion add excess of nitrate of baryta. An immediate precipitate of sulphate of baryta is formed, which is collected on a filter, washed with hot water, calcined and weighed. The weight of sulphate of baryta multiplied by 0·1373 gives the weight of sulphur contained in the urine.

The filtrate and washings are evaporated to dryness on a sand-bath. The residue is heated on an open fire until most of the carbon is burned. The residual mass is exhausted with boiling water; and, without preliminary filtration, a solution of carbonate of ammonia is added until it ceases to produce a precipitate. Then filter, wash well, and after the addition of hydrochloric acid until an acid reaction is obtained, evaporate the filtrate again to dryness. To remove the ammoniacal salts warm the residue gently: let it cool and weigh. The weight represents the sum of the chlorides of sodium and of potassium.

Dissolve in a beaker the total quantity of chlorides of sodium and of potassium, and after the addition of a few drops of a solution of neutral chromate of potassa, the total quantity of chlorine is determined by means of a titrated solution of nitrate of silver, in the manner to be explained presently in speaking of the estimation of chlorine. If we know the total quantity of chlorides of sodium and potassium, and also that of the chlorine, we can from these data, calculate the potash and the soda. Multiply the chlorine of the mixture by 2·1029; subtract from the product the sum of the metallic chlorides, and multiply the remainder by 3·6288. The result is the chloride of sodium contained in the mixture; and this subtracted from the sum of the metallic chlorides gives the amount of chloride of potassium. Chloride of potassium × 0·6309 = potassa, K O. Chloride of sodium × 0·5299 = soda Na 0.

Chlorine.—Is estimated volumetrically. A solution of nitrate of silver is prepared, titrated by a solution of pure chloride of sodium the quantity of chlorine in which is known. Thus

we can calculate how much chlorine corresponds to a cubic centimeter of silver solution. We pour into a beaker a cubic centimeter of the urine under examination, increase its volume with distilled water and add a few drops of a solution of neutral chromate of potash. Pour into the mixture from a graduated pipette the silver solution, until the liquid changes in color from canary-color to brick red. Read on the pipette the number of cubic centimeters, and by a simple calculation we ascertain the quantity of chlorine which the urine contains.

The nitrate of silver decomposes all the chlorides of the urine without attacking the neutral chromate of potash. It is only immediately after the conversion of the whole of the chlorides into chloride of silver that the nitrate attacks the chromate of potash and forms with it a chromate of silver, the red color of which replaces the yellow of the liquid. This phenomenon is due to the difference of affinities which exists between chlorine and silver, and between chromic acid and the same metal.

The author adds some analyses of albuminous and saccharine urines. He reminds us that sugar is estimated by the polarimetric method. It is insoluble in absolute alcohol and its weight must, therefore, be subtracted from the residue insoluble in alcohol in order to find that of insoluble extractive matters.

Albumen is estimated directly by the balance. It is isolated by precipitation by means of nitric acid and heat combined. It is insoluble in absolute alcohol: so that its weight, also, must be subtracted from that of the insoluble residue to get the weight of insoluble extractive matters.—*Jour. des. Conn. Méd.*

MEDICAL INTELLIGENCE.

(General Orders by the Governor in Council.)

Leave and Allowances.

3rd October, 1871.

The 14th September, 1871, No. 3,551.—The Governor General in Council is pleased to notify that a commissioned medical officer of the army holding a civil medical appointment is subject to the leave rules applicable to other military officers in civil employ.

The 15th May, 1872, No. 3,418.—In continuation of the notification of this Department, No. 3,551, dated the 14th September 1871, the Governor General in Council is pleased to rule that a commissioned medical officer of the army holding a civil medical appointment is subject to the rules applicable to other military officers in civil employ in respect to privilege as well as other leave.

Passages.—Warrant Officers.

4th June 1872.

No. 144 of 1872.—The Government of India has declared that the provisions of G. O. G. G. No. 841* of 31st August 1870, exempting Warrant Officers from the rule which withholds passages at the public expense in certain cases, do not apply to Warrant Officers holding honorary Commissioned rank.

Inspector-General of Hospitals—Leave and Allowances.

7th June 1872.

No. 609 of 1872.—The following paragraph of a Military letter from the Right Honorable the Secretary of State for

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* Madras G. O. G. 13th September 1870, No. 266.

India, No. 81, dated the 18th April 1872, is published for general information:—

Para. 1.—I have decided that an Inspector-General or a Deputy Inspector-General of Hospitals of the Indian Service, on leave in Europe, who has not completed his tour of service and has vacated his appointment, shall be granted the British pay of his rank after vacating his appointment and be allowed to count the period of his absence from India, since vacation of appointment, as service for pension, subject always to the rule as to five years' absence from India.

Leave and Allowances.

14*th June* 1872.

No. 287.—The Governor General in Council is pleased to declare that the undermentioned rules in the Civil Leave Code are applicable to Commissioned Military Officers in civil employ.

Rule 2, under section 4, (*d*) in Chapter II.
Rules 2 and 3, under section 9, (*b*) in Chapter III.
" 2 and 4, do. 15, in Chapter V.
Rule 3, under section 18, in Chapter VI.
" 2, 4, and 5, under section 21, in Chapter VII.
" 4, 9, and 10, do. 24, do. XII.

2. His Excellency in Council is also pleased to direct the re-publication of the following rules applicable to Commissioned Military Officers in Civil employ.

I.—The words "prior to his proceeding on furlough" in Section 5 of the Military furlough regulations of the 10th November 1868, shall in the case of an officer who takes subsidiary or preparatory leave before furlough, be understood to mean prior to his being relieved of his duties.

II.—Days of embarkation and debarkation are parts of furlough, and furlough allowances only are admissible for such days.

III.—Subsidiary leave ceases the day before embarkation, and commences the day after debarkation. It cannot be extended on the ground that the vessel in which an officer leaves India, or returns to it, touches at some other port in India after the first embarkation or before the final debarkation.

IV.—If an officer remains in India after the end of subsidiary leave prefixed to furlough, his furlough is held to have begun in India, and his absence on furlough is reckoned from the date on which he gave up office.

V.—An Officer may draw allowances as if he were on Privilege leave for any part of his subsidiary leave before furlough, for which, if he were not going on furlough, privilege leave would be admissible to him.

VI.—When an officer applies for leave he should distinctly state under what rule he wants leave, and show that he is entitled to leave under that rule.

VII.—Officers going on leave from the Public Works Department are required to produce no demand certificates from account officers of that department.

VIII.—The Government to which an officer is subordinate may exempt him from loss of appointment when he overstays privilege leave by more than a week.

IX.—Leave may be retrospectively commuted, by the authority which granted it, to any other kind of leave which the said authority would have been competent to allow when the original leave was sanctioned.

X.—When privilege leave is, on medical certificate, retrospectively commuted to furlough out of India, so much of the leave passed before embarkation may be treated as subsidiary leave, as the officer would have been entitled to count as subsidiary leave if he had originally obtained furlough and not privilege leave.

XI.—An officer on privilege leave cannot draw his allowances in England, but his agent may draw them in India in the manner prescribed in Rule 2 under Section 23 (*a*) of the Civil Leave Code.

XII.—If an officer receive an advance of pay in England to enable him to return to duty in India, the advance must be recovered at the rate of exchange fixed for transactions with the Imperial Government at the time it was made.

3. This notification supersedes the notes in italics below the undermentioned rules in the Covenanted Civil Service Leave Code of 1871.

Rules 5 and 6 under Section I in Chapter I.

" 2, 5, and 6 under Section VII in Chapter II.

Rule 1 under Section X in Chapter II.
Rules 1 to 4 under Section XI in Chapter III.
„ 1 and 3 under Section XII in Chapter IV.
„ 5, 7, and 8 under Section XIX in Chapter VI.
The Subsidiary rule under Section XXI, in Chapter VI.
Rules 1 and 3 under Section XXVI in Chapter IX.
„ „ „ „ XXVIII „ X.
„ „ in Chapter XII.

(General Orders by the Commander-in-Chief.)

Army Regulations.

31*st May* 1872.

No. 46.—The following alterations and corrections are ordered in the Army Regulations—Books to be corrected accordingly :—

Para. 825.—The following is to be added to Clause *(e.)*— and all applications for leave for Veterinary Surgeons other than on medical certificate should show that the request has the sanction of the Inspecting Veterinary Surgeons.

Rule XV. on page 163 is cancelled and the following substituted :—

XV.—If the aggregate of two years' furlough be exceeded whether on medical certificate or private affairs the Officer will vacate his appointment, such extension being in the case of private affairs without pay and in that of Medical certificate with English furlough pay, for a third year only.

Paras 1319 and 1320 are cancelled and the following substituted :—

1319. All therefore that need be laid down as an invariable rule is that the particular body of men among whom cholera has appeared in an epidemic form must be removed from the Cantonments. If for example, this body consist only of the inmates of some one building, the measure need only be applied to them; if some particular Company or Troop be attacked it will be similarly dealt with—A whole Regiment or the whole of the Troops at the Station need only be sent into Camp, when it is found that the measures already adopted have not stopped the

progress of the disease, or there is reason to fear that they will be insufficient.

1320. With the sanction of Government, His Excellency the Commander-in-Chief begs General Officers and the Chief Administrative Medical Officers to adopt in practice the principle contained in the foregoing paragraph, and on no account during the hot and rainy seasons to vacate whole suits of Barracks, because one or two or even more have been infected with Cholera. It is necessary only to evacuate such buildings as have actually presented cases. During the hot and rainy seasons if other buildings are available, they should be used in preference to placing the men in Camp. In short, at such seasons of the year the Camp must be held to be the last resource. This is more especially necessary when the ground is either covered with water or when it is drying after the rainy season at the Station.

Dress—Officers.

No. 107.

3rd June 1872.

G. O. No. 49* of 1872 is cancelled, and the following substituted :—

With reference to G. O. Her Majesty's British Forces, dated the 25th October 1860, the Commander-in-Chief is pleased to direct the substitution of a plain white tunic for the braided one therein prescribed.

† Page 243 S. O.

2. The tunic should be of sufficient length to just clear the saddle when the Officer is mounted, and will be fastened by four small gilt buttons of Regimental pattern, cuffs pointed, and a pocket outside the left breast, the collar rounded off in front, twisted gold cord on each shoulder.

3. The Sash will be worn on all occasions with the above tunic whether on or off duty, except when used as the Regimental Mess Dress during the hot weather.

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* Madras G. O. C. C. 6th April 1872, page 104.

† Queen's G. O. Head Quarters, Madras, 22nd November 1860, page 305.

4. Field Officers will wear their distinctive badges on the collar.

5. The tunic as above ordered will be worn by all Officers of British and Native Infantry Regiments and by Staff Serjeants.

Passage.

No. 21.

6th June 1872.

Military Department, No. 56, dated 6th January 1872, to Quarter-master-General.

* S. O. 1865, page, 71.

The annexed extract from a letter, No. 294, dated London, the 22nd November 1871, from the Right Honorable the Secretary of State for India, to His Excellency the Governor-General in Council, is promulgated for general information and guidance, with reference to G. G. O. No. 471, dated 11th May 1865,* publishing the Royal Passage Warrant of 1865.

Para. 178, "Transport of Troops by Sea," to be modified accordingly :—

"2. Your Excellency will observe that the interpretation placed upon clause 3 at page 14 of the Royal Passage Warrant of 1865, entitles the families of officers doing duty with troops in every description of vessel to free passages.

"3. I have approved of this interpretation of the Warrant, and request that it may be adopted in India for the future.

"4. The messing rates laid down at page 6 of the Royal Warrant will be chargeable in this country."

Troopships—Rations.

No. 23.

The following Horse Guards' G. O. 95 of 1871 is published for information and guidance :—

"The form of mess certificate hitherto in use on board Her Majesty's troopships will in future be replaced by a

statement that the officers named therein were messed for the periods mentioned. This statement will be signed by the military commanding officer only. Any complaints which individual officers may consider that they have reason to make, in regard to their messing, will not be inserted in the certificate, but should be forwarded through the commanding officer, as pointed out in G. O. 5 of 1869, in the same manner as complaints upon other matters. In the case of a hired vessel, the mess certificates will continue to be signed by each officer, according to the form contained in Appendix 27 of the Regulations for Her Majesty's Transport Service."

Passages.

No. 29.

Military Department, No. 1413, dated 30th January, 1872, to the Quartermaster-General.

Under instructions from Government, it is hereby notified, that when a free passage is conceded to an officer who has been removed from the service, passage money up to the amount of the P. and O. rates will be granted, but only on the production of a certificate signed by the captain of the vessel or shipping agent, shewing that the passage has been actually secured.

Leave—Medical Department.

No. 33.

In continuation of G. O. No. * 311 of 1871, the following letter from the Government of India in the Military Department, No. 335, dated 7th February 1872, to the Adjutant-General, is published for general information :—

"With reference to the letter from your office, No. 2724-E, dated 22nd December 1871, relative to the procedure to be observed in the grant of leave to medical officers of the British Service holding appointments in India, the tenure of which is limited to five years, I am directed to acquaint you, for the information of the Right Honourable the Commander-in-Chief, that all leave in India to Administrative

* Madras G. O. G. 5th December 1871.

Medical Officers of the British or Indian Medical Service should be granted by the Commander-in-Chief, the Government of India only granting them leave out of India on applications submitted through His Excellency."

2. Application for leave from the above officers will be submitted through the heads of their respective departments to the Commander-in Chief.

Passages.

No. 45.

The following extract from Bombay General Order, No. 104, dated 7th February 1872, is re-published for general *information and guidance*:—

" With reference to G. G. O. No. 785 of 1869, it having become necessary to prescribe what officers coming to Bombay, for passage to England, shortly before the commencement of the trooping season, should be detained to take their passage in the first troop ship, the Government of India has ruled that officers entitled to passage at the public expense and obtaining leave from and after the 1st September in each year, shall be required to proceed on the first troop ship leaving after their arrival in Bombay, which place they must of course reach within the time ordinarily granted to officers to proceed to the port of embarkation.

Barrack Department—Sanitary.

No. 96.

18*th June* 1872.

The Right Honourable the Commander-in-Chief is pleased to direct that one copy of the register of thermometrical observations in new and old standard barracks, ordered to be kept up in para. 6 of G. O. No. 299* of 1871 is to be furnished monthly to Deputy Inspectors-General of Circles for transmission to the Office of Inspector-General of Hospitals, Her Majesty's British Forces at Calcutta.†

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* Madras. G. O. C. C. No. 17, dated 11th March 1872.
† Mádras.

List of Children.

On account of whom Payments have been notified by the receipt of Paymaster's Statements, &c., from 30th May up to this date for securing the following rates of pensions.

Names of Subscribers.	Children's date of birth.	Sex.	Rates of Pension secured.	To what period.	Payments how made.
J. B. Fleming, M.D.	8th February 1872.	Female...	Full ...	To D. or M., &c. ...	By Donations.
W. H. Harris, M.D.	7th February 1866.	Male ...	Full ...	*From 18 to 21 years...	
Do. ...	8th August 1867.	Male ...	Full ...	* Do. ...	

N. B.—The rates of Pensions marked thus * are additional to those previously secured.

MEDICAL FUND OFFICE,
FORT ST. GEORGE,
28th June 1872.

List of Wife.

On account of whom Payments have been notified by the receipt of Paymaster's Statements, &c., from 30th May up to this date for securing the following rate of Pension.

Name of Subscriber.	Date of marriage.	Rate of Pension secured.	Payments how made.
T. Beaumont ...	27th March 1868.	*Half ...	By Donation.

N. B.—The rate of Pension marked thus * is additional to that previously secured.

MEDICAL FUND OFFICE,
FORT ST. GEORGE,
28*th June* 1872.

CORRESPONDENCE.

NICHOLSON *v.* MACNAMARA.

To the Editor of the Madras Medical Journal.

SIR,—I shall, with your permission, take an early opportunity of replying to Dr. Macnamara on the whole case. In the meanwhile allow me to draw attention to No. 2 of the experiments detailed by Mr. Hamilton in his letter.

He ignited a small quantity, 0·1 gramme, of sodium sulphate with 0·5 gramme of ammonium chloride. Dr. Macnamara says in his paper that "about twice as much" is sufficient; Mr. Hamilton gives the reaction a better chance by employing five times as much ammonium chloride. The

mixture is dissolved, evaporated, ignited and weighed, and the result, Mr. Hamilton says, is "conversion partial" as evidenced by the presence of chlorides and a loss of ·004 gramme weight. Now it is easy to calculate that had the conversion of sodium sulphate (eq. 142) into sodium chloride (eq. 117) been complete, the residue should have weighed ·0823 gramme, giving a loss of ·0177 gramme, so we find that the conversion was so partial that it only affected 22 per cent of the sulphate operated on.

If this experiment does not prove my case, it certainly disproves Dr. Macnamara's.

I thank Mr. Hamilton for making these experiments; facts are what we want, not vain quotations from text-books. But I would recommend him in future proofs of processes, to assure himself of the purity of his reagents and to give evidence thereof; in the present case no assurance is given that the sodium sulphate was pure and that the ammonium chloride did not contain fixed chlorides.

I am, &c.

EDWARD NICHOLSON.

WALTAIR,
15*th June* 1872.

GUMS AND GUM-RESINS.

To the Editor of the Madras Medical Journal.

SIR,—In my notes upon "The gums, gum resins, &c.," published in your Journal for June, by some error, or by the ingenuity of the printers' "devils," the people of this District are called Roeys instead of Koeys. I was mistaken about the supply of gum from the *Sterculia Urens*, it is procurable only during the cooler months of the year; and although the natives here say that the *Terminalia Arjuna* produces gum spontaneously in very large quantities, yet I have been able only to obtain it in small lumps.

Your obedient servant,

H. S. HAZLETT,

Assistant Surgeon.

DUMAGUDEM,
16*th June* 1872.

TO CORRESPONDENTS.

Inspector-General, Indian Medical Department.—Honorary Sub-Assistant Surgeon M. JAGANATHUM NAIDOO.—MR. JOHN LANCASTER.—*Received with thanks.*

BOOKS, &c., RECEIVED.

The Medical Record, *March 1st.*

The Medical Press and Circular, *May* 1*st*, 8*th*, 15*th*, 22*nd*, 29*th*.

The Doctor, *May* 1*st.*

Journal des Connaissances Médicales, *May* 15*th*.

Spurious, Feigned, and Concealed Pregnancy, by Thos. Moore Madden, M.D.

The Secretaries ROYAL MEDICAL BENEVOLENT FUND SOCIETY OF IRELAND, *acknowledge with many thanks receipt of the following Subscription and Donation.*

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